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In the Supreme Court of the
United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, a corporation,
Appellant,

vs.

STATE OF ARIZONA ex rel. JOE CONWAY,
Attorney General of the State of Arizona,
Appellee.

APPELLANT'S REPLY BRIEF

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Subject Index

	Page
Foreword	1
I. The Legal Issues	2
1. The Exclusive National Field	2
2. The Extra-Territorial Effect of the Law	16
3. "The Occupied Field"	19
4. The Unreasonableness of the Law as a Purported Safety Measure	24
II. The Factual Issues	30
1. The Significance of the Trial Court's Findings and the State Supreme Court's Reference Thereto	30
2. "Local Conditions"	34
3. "Burden on Interstate Commerce"	40
(a) The Comparisons of Train-Length and Effi- ciency Trends	41
(b) The Redischatching Studies	50
4. The Train Limit Law Has No Rational Basis as a Safety Measure	61
(a) "Slack-Action Accidents and Injuries"	63
(b) Train Length Is Not the Sole or Controlling Factor in Slack-Action Accidents	69
(c) There Is No Actual and Substantial Hazard to the Public From Slack-Action on Freight Trains on Appellant's Lines in Arizona	76
(d) The Law Increases Rather Than Reduces the Hazards Due to Defects in or Failures of Freight-Car Equipment	77
(e) The Alleged Difficulty of Seeing or Under- standing Signals on Long Trains Does Not Result in Any Measurable Hazard	79
(f) The Alleged Hazard From Failure to Detect Defects on Cars of Long Trains Is Likewise Unsubstantial	80

	Page
(g) The Alleged "Fear of Long Trains" Is Unfounded	82
(h) By Increasing the Number of Trains and the Number of Employees Required, the Law Increases the Hazard of Accidents Due to Employee Negligence	83
(i) The Law Greatly Increases the Hazard of Grade-Crossing Accidents	85
5. Appellant's Safety Evidence	89
(a) "The National Evidence"	90
(b) The Arizona-Nevada Comparisons	100
(c) Los Angeles Division Casualty Statistics	102
(d) New Mexico Casualty Statistics	104
(e) Santa Fe and Chesapeake & Ohio Casualty Statistics	105
6. Alleged Passenger Train Hazards	108
7. "Summary of Safety Argument"	112
Conclusion	114

Table of Authorities Cited

"CASES"	Pages
Alabama Power Co. v. Ickes, 302 U.S. 464	32
Arkansas Full Crew Cases, 219 U.S. 453, 283 U.S. 249	18
Atlantic Coast-Line R. Co. v. Georgia, 234 U.S. 280	18
Atlantic etc. Tea Co. v. Grosjean, 301 U.S. 412	32
A. T. & S. F. Ry. Co. v. Railroad Commission, 283 U.S. 380	26
Baldwin v. Seelig, 294 U.S. 511	17
Borden's Farm Products Co. v. Ten Eyck, 297 U.S. 251	32
Bowman v. C. & N. W. Ry. Co., 125 U.S. 465	17
Butte & Superior Copper Co. v. Clark-Montana Realty Co., 249 U.S. 12	32
California v. Thompson, 313 U.S. 109	9, 13, 14
Clark v. Gray, 306 U.S. 583	32
Commissioner v. Scottish-American Inv. Co., No. 52, etc., Oct. Term, 1944 (Dec. 4, 1944)	32
Di Santo v. Pennsylvania, 273 U.S. 34	15
District of Columbia v. Pace, 320 U.S. 698	32
Edwards v. California, 314 U.S. 160	7, 12, 15
Erie R.R. Co. v. Board of Commissioners, 254 U.S. 294	26, 27
Ex Parte No. 156, 256 I.C.C. 523	11, 113
First Arizona Train Limit Case, 2 Fed. Supp. 855	102
Foster Fountain Packing Co. v. Haydel, 278 U.S. 1	4
Graves v. O'Keefe, 306 U.S. 466	15
Hall v. De Cuir, 95 U.S. 485	15, 17
Just v. Chambers, 312 U.S. 383	40
Kansas City Southern Ry. v. Kaw Valley Drainage Dist., 233 U.S. 73	7, 12
Kelley v. Washington, 362 U.S. 1	9, 14
LaCoste v. Dept. of Conservation, 263 U.S. 545	4
Lehigh Valley R. Co. v. Board of Commissioners, 278 U.S. 24	26, 27

Pages

Maurer v. Hamilton, 309 U.S. 598	16, 17, 18
Milk Control Board v. Eisenberg, 306 U.S. 346	4, 15, 25
Milk Wagon Drivers Union v. Meadowmoor Dairies, 312 U.S. 287	32
Minnesota Rate Cases, 230 U.S. 352	4
Missouri v. Kansas Natural Gas Co., 265 U.S. 298	15
Missouri-Pacific R.R. Co. v. Norwood, 283 U.S. 249	22
M. K. & T. R. Co. v. Texas, 245 U.S. 484	7, 8
New York Central R. Co. v. United States, 265 U.S. 41	20
Norfolk and Western R. Co. v. Conley, 236 U.S. 605	33
N. Y. H. & H. R. Co. v. New York, 165 U.S. 628	18
Parker v. Brown, 317 U.S. 341	4, 6, 9, 13, 14, 15, 25
Railroad Retirement Board v. Alton R. Co., 295 U.S. 330	94
Seaboard Airline Ry. Co. v. Blackwell, 244 U.S. 310	7, 8, 12
Shafer v. Farmers Grain Co., 268 U.S. 189	6
South Carolina Highway Dept. v. Barnwell Bros., 303 U.S. 177	7, 9, 13, 16, 17, 25, 32
South Covington R. Co. v. Covington, 235 U.S. 537	7, 8, 12, 19
Southern Pacific Co. v. Mashburn, 18 Fed. Supp. 393	74, 102
Sproles v. Binford, 286 U.S. 374	16, 18
St. Louis Southwestern Ry. Co. v. Arkansas, 217 U.S. 136	7
Terminal Railroad Assn. v. Brotherhood, 318 U.S. 1	18, 19, 25
Texas & New Orleans R. Co. v. Railway Clerks, 281 U.S. 548	40
Truax v. Corrigan, 257 U.S. 312	33
Union Brokerage Co. v. Jensen, 322 U.S. 202	6
Virginian Railway Co. v. U. S. (C.C.A. 4), 223 Fed. 748	20, 21, 23
Welton v. Missouri, 91 U.S. 275	15

STATUTES

Arizona Annotated Code, 1939, Sec. 21-1028	31
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APPELLANT'S REPLY BRIEF

FOREWORD

Following the plan of our Opening Brief, this Reply is in two sections: the first addressed to those portions of appellee's brief which undertake to deal with the legal principles involved; the second to those portions wherein the facts are discussed.

THE LEGAL ISSUES

1. THE EXCLUSIVE NATIONAL FIELD

(Appellee's Brief, pp. 20-41)

At the outset of its discussion of the "exclusive national field" appellee quotes from pages 82-83 of Volume I of appellant's Opening Brief, and then asserts that our position is based upon certain assumptions: (1) that the challenged law has a real relation to the safety of those within the state, and operates in a field not occupied by Congress; (2) that the right of the state to exercise its reserved police power depends upon a judicial determination whether the subject matter is of such exclusive national concern, that *as a matter of policy* it should be regulated by Congress and not by a state legislature; and (3) that in making this judicial determination this Court is "prohibited" from considering whether the state statute has a safety purpose. From these premises appellee concludes that we have contended that the validity of a state law, admittedly having a safety purpose and otherwise valid as an exercise of police power, would be made subject to the opinion of the Court as to whether the protection should be by federal or state legislation.

Appellee has misconceived our position upon the exclusive national field issue. We do not "assume" that the Train-Limit law was either enacted in the interest of safety, or has any relation to that asserted purpose; for we know the contrary to be true. Neither do we "assume" that the right of the state to legislate in the interest of safety, but upon a subject matter falling within the exclusive national field, is dependent upon considerations of policy to be de-

terminated by this Court; for we know that in such a case the "policy" is that laid down by the Commerce Clause.

While we believe that our position is accurately stated in our opening brief (Vol. I, pp. 81-82, 155-156), it is desirable, in view of appellee's misconception, again to set it forth in precise language. It is our contention that the grant of power to Congress by the Commerce Clause, of its own force and without action by Congress, established the essential immunity of interstate commerce from direct control of the states with respect to those subjects which are of such nature as to demand that, if regulated at all, their regulation should be prescribed by a single authority; that as to those subjects which require a general system or uniformity of regulation, the power of Congress is exclusive. It is our further contention, supported by both unchallenged fact and abundant authority, that the length and consist of interstate railroad trains is a subject of such nature as to demand regulation by a single authority, and therefore within the exclusive national field.

We assert also that, as a necessary consequence of these principles, in considering the validity of the challenged law as an invasion of this exclusive national field the question of its *purpose*—i.e., whether it is a police-power measure, in the interest of safety or otherwise—need not and should not be considered. For if the subject matter falls within the national field, then the power of the national government is exclusive; the state cannot regulate for any purpose, or under any guise or pretext; and any purposes, whether of safety or otherwise, ascribed or claimed for attempted action by the state in the exclusive field, are wholly immaterial. It is only after the determina-

tion has been made that the subject-matter is not within the exclusive field; but instead within the concurrent or permissive field; that consideration need be given whether the asserted police power of the state has been properly exercised.

The determination whether the subject-matter is of exclusive national concern, and *as such*, within the exclusive national field, is not a determination of policy, but of law, to be made upon the basis of the facts developed by the record or judicially known to the Court, and in the light of applicable principles. This determination is one which the Court must make for itself (*LaCoste v. Dépt. of Conservation*, 263 U.S. 545, 550), by looking to practical considerations (*Foster Fountain Packing Co. v. Haydel*, 278 U.S. 1, 10); and it will answer the question whether a challenged regulation is a direct burden upon and an obstruction to interstate commerce and therefore prohibited, or merely incidental and therefore permissible, by weighing the *nature* of the activities regulated and the propriety of local regulation of them, as disclosed by the record (*Milk Control Board v. Eisenberg*, 306 U.S. 346, 352); i.e., the question will be determined "upon a consideration of all the relevant facts and circumstances" (*Parker v. Brown*, 317 U.S. 341, 362-363). The "question of policy" has been settled by the Constitution, in that the Commerce Clause confers upon Congress the exclusive power to regulate those subject matters which, by their nature, are determined to be of exclusive national concern.

Appellee in this discussion takes the position that the law, because assertedly enacted in the interest of safety,

does not infringe the exclusive field, but instead is within the so-called joint or concurrent field, in which the states may regulate matters of local concern even though commerce is affected, and provided that Congress has not acted; for, according to appellee, "protection against accidents is a local matter or problem" (its brief, p. 40). From this premise appellee proceeds to the conclusion that in determining whether the law invades the exclusive national field, it must *first* be determined whether it is unreasonable or passes beyond the bounds of suitable local protection; for only if this is shown, appellee argues (its brief, p. 23), can it be concluded that the law *directly* regulates interstate commerce and so violates the Commerce Clause.

The fundamental fallacy of appellee's argument lies in its failure to distinguish between the *purpose* to which the challenged law is allegedly addressed, and the *subject-matter* regulated. The claimed *purpose* of the law is the protection of employees and others from dangers alleged to be peculiar to long-train operation, i.e., greater safety; but "safety" is *not* the subject-matter regulated. This is shown by the text of the law itself. Neither the word "safety," nor any word or phrase of similar connotation, appears therein. The title of the law declares it to be "An Act limiting the number of cars in a train"; the phraseology of the statute refers only to the operation of railroad freight and passenger trains. The subject-matter of the law is therefore the length and consist of railroad trains and, in its application to the present case, of trains operated by an interstate railroad in the transportation of interstate commerce.

Many decisions of this Court make clear the point that the claimed or stated purpose of a challenged law does not determine whether it invades the exclusive national field. That determination rests upon the nature of the subject-matter regulated and the incidence of the regulation upon interstate commerce. Thus, in the *Minnesota Rate Cases*, 230 U.S. 352, in the very portions quoted by appellee, the Court declared (p. 400) that the power of Congress is exclusive, and the states are deprived of power to regulate directly "under any guise," with respect to "those subjects . . . which are of such a nature as to demand that, if regulated at all, their regulation should be prescribed by a single authority"; i.e., "those subjects which require a general system or uniformity of regulation." In *Shafer v. Farmers Grain Co.*, 268 U.S. 189, 199, the Court pointed out that "a state statute which by its necessary operation directly interferes with or burdens such (interstate) commerce is a prohibited regulation and invalid, regardless of the purpose with which it was enacted." In *Union Brokerage Co. v. Jensen*, 322 U.S. 202, 210, it was said that "the incidence of the particular state enactment must determine whether it has transgressed the power left to the states"; i.e., whether it has invaded the exclusive national field; and in *Parker v. Brown*, 317 U.S. 341, 362, the Court repeatedly referred to the necessity of a consideration of all the relevant facts and circumstances, in order to determine whether a challenged regulation controls matters of local concern, which were declared to be appropriate subjects for local regulation, provided the national interest is not impaired nor the free flow of commerce obstructed.

Appellee asserts (its brief, pp. 25-26) that this Court has consistently held that state police-power legislation in a field not occupied by Congress comes within the permissive field and, if otherwise valid, is valid under the Commerce Clause until superseded by federal legislation. This is not a correct statement of the effect of the decisions of this Court, for it is equivalent to declaring that the Court has held that a state statute enacted for the purpose of health or safety or public welfare is always in the joint field, no matter whether directed at and directly regulating interstate commerce; and regardless of its effects upon that commerce. Contrary to appellee's contention, "the decisions of this Court have recognized that there is scope" for the operation of the Commerce Clause to strike down state legislation, when such legislation, though "nominally of local concern, is in point of fact aimed at interstate commerce, or by its necessary operation is a means of gaining a local benefit by throwing the attendant burdens on those without the state" (*South Carolina Highway Dept. v. Barnwell Bros.*, 303 U.S. 177, 185-186). Conspicuous examples of decisions of this type include those particularly cited at pages 105-109, 120-121, and 188-189 of Volume I of appellant's opening brief: e.g., *Kansas City Southern Ry. v. Kaw Valley Drainage Dist.*, 233 U.S. 75; *Seaboard Airline Ry. Co. v. Blackwell*, 244 U.S. 310; *Edwards v. California*, 314 U.S. 160; *South Covington R. Co. v. Covington*, 235 U.S. 537; *M. K. & T. R. Co. v. Texas*, 245 U.S. 484; and *St. Louis Southwestern Ry. Co. v. Arkansas*, 217 U.S. 136. In the *Kansas City Southern* and *Edwards* Cases, state regulations having an obvious relation to the public welfare were set aside under

the Commerce Clause, despite attempts to defend them "by invoking the convenient apologetics of the police power," because they directly obstructed the free movement of persons and property in interstate commerce. In the *Blackwell Case* a state regulation, plainly in the interest of safety because it would have greatly reduced if not entirely eliminated hazards at grade crossings, was set aside under the Commerce Clause because of the direct burden and interference with interstate commerce. In the *M. K. & T. Ry. Case*, a state regulation intended to promote the convenience of passengers, and thus a clear exercise of the police power, was set aside because it directly regulated the operation of interstate passenger trains. In the *Covington Case* a city ordinance intended to promote the comfort and convenience of passengers, and having an obvious relation to that purpose, was set aside because by limiting the number of passengers which could be carried in a car it would have compelled a street car company operating in and between adjoining cities in different states to run more cars, not only within Covington, but also across the state boundary, and in the neighboring city of Cincinnati. On the facts it was held that this was a direct regulation of interstate commerce in the exclusive national field.

It is apparent from these examples that the mere purpose claimed for a state regulation, or even a showing of reasonable relation to that purpose, is not sufficient to place it within the permissive field if in fact the subject-matter is within the exclusive national field and the effect is to regulate commerce directly. In such cases, particularly if the subject is one "demanding uniformity of regula-

tion . . . state action is altogether inadmissible." The Constitution itself occupies the field, even if there is no federal legislation (*Kelly v. Washington*, 302 U.S. 1, 9).

Apparently realizing that the question whether the subject-matter is of *national*, rather than *local* concern (and not the claimed purpose of the law), is determinative of the "national field" issue, appellee has attempted, in its references to the facts (its brief, pp. 7-8, 39, 131-132) to make it appear that there are special local conditions in Arizona which warrant separate treatment and indicate that because of the practical difficulties involved, the subject-matter cannot receive adequate attention from Congress. Thus it has been recognized that this question is one for judicial determination, upon the facts developed by the record or judicially known to the Court.

The special findings of the trial court (Findings VI(c), VII(b)(2); R. 3908, 3919) show that there are no special local conditions in Arizona which render the regulation of the length and consist of interstate trains operated in that state a matter peculiarly of *local*, as distinguished from *national*, concern, in the sense intended by this Court's decisions: e.g., *South Carolina Highway Dept. v. Barnwell Bros.*, supra; *California v. Thompson*, 313 U.S. 109, and *Parker v. Brown*, supra. Rather, the facts show that this subject-matter is not one admitting of diversity of treatment; that no practical difficulties are involved, such as to prevent adequate treatment by Congress; that it is outstandingly of national concern, for a variety of controlling reasons:

First, the traffic carried in the interstate trains regulated by the Arizona law is almost wholly interstate and

not local in character. These trains move in a continuous course in interstate commerce over lines (in Arizona) which are an integral and inseparable part of appellant's railroad, the latter in its turn being equally an essential and inseparable part of the entire national transportation system.

Second, the law imposes physical obstructions to the free flow and movement of interstate commerce amounting, if not to an absolute barrier, to at least a very effective hindrance, such that, as stated by the trial court (B-4048), "practically . . . Arizona operations create a bottleneck." Even in times of light traffic these obstructions materially impede the free flow of commerce; but in times of heavy traffic and urgent demand such as have continued ever since the commencement of this case, their effects are much more serious, because they actually limit the traffic capacity of the appellant's railroad plant.

Third, if Arizona may validly regulate the length of interstate trains, so may all the other states; and such regulations need not be the same as in Arizona or confined, as is the Arizona law, to a maximum length. It is just as competent, and in the light of this record would be considerably more logical in the interest of safety, for a state to provide by law that trains below a specified minimum length should not be operated for the handling of through interstate traffic. The handicaps imposed by attempting to comply with even varying maximum limitations sufficiently show, however, that the subject-matter is one requiring a national and uniform system of regulation, if any be necessary.

Fourth, there are the inevitable and unchallenged extra-territorial effects of the law. Appellee makes no attempt to deny that the law can be fully observed; *within* Arizona, only by complying with the limitations for substantial distances outside; that it is impossible to provide exactly at the state boundary lines the terminal and other facilities required to make the necessary changes in train lengths.

Fifth, the law effectively prevents the attainment of the improved efficiency, economy, safety, and adequacy of interstate transportation service by rail, especially declared by Congress in the preamble to the Transportation Act 1940 to be a national transportation policy, to be promoted, as Congress said, to the end of developing, coordinating, and preserving a national transportation system adequate to meet the needs of commerce and of the national defense.

Sixth, the subject-matter is of immediate and pressing national interest at the present time; because the law, though temporarily suspended, has interfered and still interferes with and obstructs the speedy and efficient use of equipment and manpower in the national defense, causes congestion, delay, and waste, and actually limits the transportation capacities of the affected lines. These are the specific findings of the Interstate Commerce Commission in the recitals of Service Order No. 85, affirmed when the order was sustained: *Ex Parte No. 156*, 256 I.C.C. 523.

Although the nature of the subject-matter regulated completely determines whether the exclusive national field

is invaded; we do not contend that the claimed or stated purpose of the challenged statute is not to be considered. If the facts show that the regulation has no legitimate purpose, it cannot be sustained even though the subject-matter is of local rather than national concern. It is for this reason that in many decisions, examples of which are among those cited by appellee, the safety or other correlative purpose has been so carefully set forth. This mention does not support appellee's erroneous theory that the claimed or intended purpose is one and the same with the subject-matter regulated; or that the purpose, though declared or apparent, constitutes any criterion whether the exclusive national field is invaded. The purpose may be wholly legitimate, as in the *Kansas City Southern, Blackwell, South Corington*, and *Edwards Cases*, for example; and yet the law will fall as a violation of the Commerce Clause.

Moreover, in the case at bar, appellee's attempted emphasis on purpose is misplaced. The text of the law pointedly omits any reference to the safety purpose now claimed. There are no facts shown of record, nor any factual circumstances which the Court may judicially notice, which support appellee's theory that the law has or ever had a safety purpose. The evidence shows that when it was enacted the legislative purpose was quite different (R. 1107-1108; Exs. 149, 150, 182, 213). There was no contemporaneous long-train operation in Arizona, hence there could not have been any purpose to forbid an operating practice known or suspected to be unsafe. The law in fact made no change in operations as then conducted. The selection of the 70-car limit, at the time the effective oper-

ating maximum for Southern Pacific freight trains in Arizona because of prevailing siding capacities on its single track line, demonstrates that the purpose was to maintain employment levels by freezing the operations in the mold of 1912; so that, whatever might be future improvements in road, equipment, and railroad practice generally, permitting the operation of fewer and longer trains, the Arizona railroads would still be compelled to continue to operate many more trains and employ many more train and engine men than otherwise necessary. Certainly this is the sole effective result of the law, and the only purpose which can logically be assigned.

Appellee asserts (brief, p. 35) that the determination whether a challenged regulation imposes too severe a burden upon interstate commerce is for Congress and not for this Court, the function being assertedly legislative and not judicial; citing in particular, *California v. Thompson*, *Parker v. Brown*, and *South Carolina Highway Dept. v. Barnwell Bros.*, supra, and quoting at length from the latter (303 U.S., at pp. 189-190). This argument was anticipated, and is largely answered in Volume I of our opening brief, at pp. 97, 147-154, 169, 197.

This Court, while it has employed the expressions quoted by appellee, has carefully limited the effect of the doctrine stated to those regulations which fall within the concurrent or permissive field, as distinguished from the exclusive national field. Thus in the *Barnwell* opinion, in the paragraphs immediately preceding that from which appellee quotes (see 303 U.S., at pp. 187-189), the Court especially stated that the subject-matter of the regulation there challenged was peculiarly of local concern, and in

that respect, since it involved the use of local highways, quite unlike the regulation of railroad operations.

Appellee has omitted, from the quotation of this opinion at pp. 36-37 of its brief, the phrase "otherwise permissible," and thus overlooked its significance as applied to those state regulations concerning which the legislative rather than the judicial function is to be invoked. A state regulation of a matter of national concern, requiring a uniform standard and system of regulation, is not "otherwise permissible." In such a case the Commerce Clause itself, as applied by the Court, constitutes the prohibition which invalidates the attempted state action, and the exercise of the congressional function becomes unnecessary. In *California v. Thompson*, and *Parker v. Brown*, the emphasis was likewise upon the question of the validity of regulations "of matters of local concern," which also operate as regulations of interstate commerce; and there is no statement by the Court which indicates that as to matters of national concern the remedy lies only in the legislative branch.

To support this argument appellee also asserts (its brief, pp. 31-32) that "no real problem is presented as to how Congress may enter the field and thus exclude the states." Appellee then cites examples whereby state enactments in the joint field have been set aside: a wholly distinct situation, since the subject-matter of the Train Limit law is of exclusive national concern. "In that class of cases the Constitution itself occupies the field, even if there is no federal legislation" (*Kelly v. Washington*, 302 U.S. 1, 9); the grant of power by the Commerce Clause having itself "established the immunity of interstate commerce from

the control of the states respecting all those subjects" which demand uniform regulation (*Milk Control Board v. Eisenberg Farm Products*, 306 U.S. 346, 351; *Edwards v. California*, 314 U.S. 160, 176). In this field, silence or inaction by Congress is equivalent to a declaration that interstate commerce shall be untrammelled (*Welton v. Missouri*, 91 U.S. 275, 282; *Hall v. De Cuir*, 95 U.S. 485, 489; *Missouri v. Kansas Natural Gas Co.*, 265 U.S. 298, 310; *Graves v. O'Keefe*, 306 U.S. 466, 479, n. 1). The fact that Congress has indeed refused several times (R. 184-185) to pass legislation directly imposing fixed maximum limits upon interstate trains clearly shows its conviction that no further regulation of this type is needed. It is therefore improper, as well as unnecessary, for those interested in removing the state restriction to address themselves to Congress. They are properly seeking relief in the courts, whose paramount duty is to interpret and apply the Constitution.

It is conceded by appellee (its brief, p. 21) that a state may not, under the guise of the police power or otherwise, directly regulate commerce. While this Court has indicated (*Parker v. Brown*, supra, 317 U.S., p. 362; compare *Di Santo v. Pennsylvania*, 273 U.S. 34, 44) that the terms "direct" and "indirect" are not wholly satisfactory for the purpose of characterizing the effects of a challenged state regulation, nevertheless they are quite significant in this case. This statute cannot be described as other than a direct regulation of the length and consist of interstate trains, and thus of interstate commerce. It has no other result. Every one of appellant's main line trains in Ari-

zona upon which this statute operates is an interstate train. About 93% of the traffic handled is interstate commerce; and some 65% thereof in the case of freight, and 75% thereof in the case of passengers, is moving between points outside of Arizona, as to which Arizona is simply a "bridge." Thus the statute, though claimed to be ("nominally") of "local concern, is in point of fact aimed at interstate commerce," and by necessary operation is a means of gaining a local benefit (of artificially increased employment) "by throwing the burdens on those without the state"; i.e., upon those who patronize the interstate trains crossing Arizona: compare *South Carolina, etc. v. Barnwell Bros.*, supra, 303 U.S., pp. 185-186.

2. THE EXTRA-TERRITORIAL EFFECT OF THE LAW

(Appellee's Brief, pp. 52-57)

Appellee's discussion of the extra-territorial point is very limited, apparently because it has no effective answer grounded in either law or fact.

Its principal reliance is upon decisions upholding state regulation of trucks on state highways (*South Carolina Highway Dept. v. Barnwell Bros.*, supra, 303 U.S. 477; *Maurer v. Hamilton*, 309 U.S. 598; *Sproles v. Binford*, 286 U.S. 374); and it asserts, though without factual support, that the regulations considered in those cases "probably" imposed far greater extra-territorial burdens upon interstate commerce than the Train-Limit Law. In our discussion of these cases in our Opening Brief (Vol. I, at pp. 147-154, 169-171), we pointed out that no questions of extra-territorial effect were involved. This Court remarked, however, in a footnote to the *Barnwell* opinion

(303 U.S., at p. 185), that "state regulations affecting interstate commerce, whose purpose or effect is . . . to burden those out of the state, without any corresponding advantage to those within, have been thought to impinge upon the constitutional prohibition (the Commerce Clause) even though Congress has not acted." (Emphasis supplied.) *Hall v. DeCuir*, 95 U.S. 485; *Bowman v. C. & N. W. Ry. Co.*, 125 U.S. 465; and *Baldwin v. Seelig*, 294 U.S. 511, cases upon which we rely in our extra-territorial argument (our brief, Vol. I, pp. 160-166), were cited with apparent approval.

The *Barnwell* opinion indicates also, and the *Maurer* opinion confirms, that there is a substantial distinction, in the mind of the Court, between state regulation of interstate railroads, operating upon their own rights of way, and similar regulation of the use of the state-owned highways. "Unlike the railroads, local highways are built, owned and maintained by the state or its municipal subdivisions. The state has a primary and immediate concern in their safe and economical administration" (*Barnwell* opinion, 303 U.S., p. 187). The regulatory problems involved in the regulation of motor vehicle traffic bear little resemblance to those of other systems of transportation; "our most extensive experience had been in the national regulation of rail carriers, operating over roads and with rolling stock privately owned and controlled, with standards of roadbed, operation, and equipment substantially uniform throughout the country, and with the movement of traffic on each road subject to a single unified control. Regulation of vehicular traffic over the highways of the United States involves a far more varied and complex

undertaking." (Maurer opinion, 309 U.S. 598, 609; emphasis supplied.)

While states may act *within* their respective jurisdictions, according to the special requirements of local conditions, by the same token "one state cannot establish standards which would derogate from the equal power of other states to make regulations of their own." (Sproles opinion, 286 U.S., p. 390). The Arizona law has exactly these effects: admittedly, it cannot be observed within Arizona, in its application to interstate trains in continuous movement, without also controlling train lengths in California and New Mexico, and thus derogating from the equal power of those states to make corresponding regulations of their own.

Cases cited by appellee relating to railroad operations include: *N. Y. H. & H. R. Co. v. New York*, 165 U.S. 628; *Atlantic Coast Line R. Co. v. Georgia*, 234 U.S. 280; the *Arkansas Full Crew Cases*, 219 U.S. 453, 283 U.S. 249; and *Terminal Railroad Assn. v. Brotherhood*, 318 U.S. 1. In each of these, other than the *Terminal Railroad Case*, certain changes in railroad crews or equipment were apparently required at state lines; but none involved a regulation which by inevitable effect controlled interstate commerce far beyond the boundary. There was no actual claim of substantial extra-territorial effect, but only that interstate operations would be "inconvenienced" at the boundaries. Here it is conceded that the law directly controls the operations for considerable distances beyond the boundaries, and the changes compelled are not and cannot be effected at the state line.

In the *Terminal Railroad Case* the only extra-territorial effect resulted from a requirement for the use of cabooses in interyard or transfer movements, including those crossing the Mississippi between St. Louis and East St. Louis. The actual extra-territorial effect thus caused would be comparatively slight, and could well be termed inconsequential. There is a vast difference between hauling a caboose attached to a cut of cars, for a few hundred yards from the state boundary to the first point where it may be detached, and the compelled operation of short trains for substantial distances beyond the boundary.

Moreover, the *Terminal Railroad Case* should be read in the light of *South Covington R. Co. v. Covington*, 235 U.S. 537, cited in footnote 16, 318 U.S., p. 9. In the *Covington Case*, the extra-territorial effect of a local regulation was clearly involved and, in fact, was a primary reason for holding it invalid.

The law is plainly a regulation aimed at interstate commerce, one of whose principal effects is to impose burdens upon and obstructions to commerce, as carried on outside of Arizona. This Court's decisions establish that a law which inevitably imposes such extra-territorial burdens and obstructions is invalid under the Commerce Clause, whether or not it be called a "local" regulation.

3. "THE OCCUPIED FIELD"

(Appellee's Brief, pp. 57-78)

Appellee's argument upon the above topic has been generally anticipated and largely covered in the section of our Opening Brief devoted to this issue (Vol. I, pp. 209-254).

Appellee attempts to establish a lack of conflict between Sections 1 and 9 of the Federal Safety Appliance Act and Section 25 of the Interstate Commerce Act, on the one hand, and the Train Limit Law on the other, by asserting (its brief, pp. 61-64) that the only purpose or effect of the federal statutes is to prescribe the brake equipment and other appliances, required for the control and stopping of trains, to be used on the cars and trains of interstate railroads; and infers that these statutes are not concerned with the effectiveness of these appliances in actually controlling trains, but only with the application of a sufficient number and proportion, in working order. Appellee then says (its brief, p. 66) that the Train Limit Law is not concerned with ("does not regulate") mechanical equipment, but occupies only the field of "the number of cars which may be run in a train."

This argument fails to give any weight to the long-standing construction of the Safety Appliance Act. In *Virginian Railway Co. v. U. S.* (C.C.A. 4), 223 Fed. 748 (approved by this Court through subsequent citation: *New York Centrl R. Co. v. United States*, 265 U.S. 41, 46), the railroad was convicted of violating the Act by having operated trains fully equipped with all of the power-brakes and appliances required by law and the order of the Interstate Commerce Commission, admittedly in good working order: because these trains were so long and so heavy that, "in the circumstances of their operation" (i. e., in consideration of the grades, etc. encountered) they could not be adequately controlled by the engineers in charge, by use of those brakes. It was shown in the case that shorter trains, equipped with the same

brakes, and indeed composed of the same cars, could be and were properly controlled in their operation over the same lines. Thus the Safety Appliance Act was construed as requiring not merely the presence of air brakes on the cars, but also that they be *adequate* to control trains *safely*, and as *limiting* their *lengths* to that number of cars which, in all the circumstances of operation, could be *safely* controlled thereby.

The Safety Appliance Act as thus construed is clearly a "train-limit" law; but (as contrasted with the Arizona law) is reasonable and logical because the limit may vary according to circumstances, and is to be determined by a trial court by an *analysis of the facts* when and if, as in the *Virginian Case*, a railroad is prosecuted for operating a train claimed to be too long for safe control.

The Safety Appliance Act has been supplemented since 1920, and especially since 1937, by the Safety Section (now Section 25) of the Interstate Commerce Act, which gives the Commission the power and duty (among others) to investigate and determine the effectiveness of appliances used for controlling and stopping railroad trains. Under this section the Commission has quite recently (July 29 and October 19, 1944) issued and amended its order (presently tentative, but expected shortly to be made final) prescribing specifications for brakes on freight cars, and in particular that such brakes shall be operative on ("based upon") *trains of 150 cars* (see pp. 7 and 9 of the Appendix to Vol. I of our brief).

The principal justification attempted for the Arizona law is that because of slack action freight trains of more

than 70 cars cannot be safely handled and controlled in motion or stopped, with the present type of air brakes, even though these have been greatly improved.¹

This was the burden of the oral testimony of appellee's witnesses, and is the conclusion which it seeks to draw from the lengthy excerpts from the air-brake instruction books (Exhibits 152, 319; R. 3445-3640), quoted in its argument upon the safety issue (its brief, pp. 91-93).

The effect of the law is thus to impose an arbitrary limit, assertedly required because longer trains cannot be safely controlled, and made to apply to all trains regardless of conditions; this although the federal statutes and orders contemplate that trains may be operated up to any length at which the air brakes will function to control the train adequately, due consideration being given to the relevant circumstances. Thus, Arizona has substituted its legislative fiat, not based upon a showing of the actual limit at which the air brakes properly function (but instead upon the siding capacities prevailing in 1912 on the appellant's main line), in place of the limit which might be found proper by a federal court or jury, in the

¹It is true that appellee assigns (its brief, pp. 65, 73, 74, 106-111, 146) other alleged dangers of long-train operation as reasons for the law: e. g., the supposed difficulty of passing signals and observing defects; the alleged loss of efficiency due to fear; and the increased responsibility of members of the crew. Appellee fails, however, to refer to any accident or casualty in Arizona or Nevada, or elsewhere upon appellant's lines, occurring on a long train, and shown to be due to any of these causes, or as to which it was or could reasonably be claimed by any witness that the accident would not have happened on a short train, or, if happening, would have been less severe. The trial court found (R. 4023-4032) that these alleged hazards, as well as those supposed to arise from the asserted greater difficulty of controlling long trains, are largely imaginary.

light of the proof adduced in a prosecution under the Safety Appliance Act for operating a train which allegedly could not be safely controlled.

Clearly this constitutes a direct conflict between the federal and state statutes, forcefully exemplified by the Arizona long-train operations of 1940. Appellant operated 302 long freight trains and 62 long passenger trains in the state during March and April of that year. There is no testimony that any difficulty was met in handling, controlling, or stopping any of these trains. There is positive testimony from engineers who handled or rode upon some of these trains that there were no such difficulties (R. 2435, 2815). The fact that no casualties of any kind occurred on any of these long trains while in motion indicates that there was no lack of proper control. Every one of these trains was therefore lawful under the federal acts. Equally, every one of them was unlawful and forbidden by the state act. The conflict therefore was and is direct and complete.

Although this particular example of conflict is cited in our Opening Brief (Vol. I, p. 240), appellee offers no comment in its reply. There is no effective answer.

Appellee also argues (its brief, pp. 74-76) that absence of conflict between the state and federal laws is shown by the asserted lack of power in the Commission to issue an order limiting train lengths. Whether or not the Commission has such power is immaterial to the present issue. The Safety Appliance Act, as ~~construed~~ in the *Virginian Case*, supra, 223 Fed. 748, itself prohibits the operation of any train which, even though equipped throughout with

functioning brakes, is so long that it cannot be adequately controlled. No order of the Commission was required in 1912, or would now be required, to support a prosecution for operating a train which because of length could not be controlled. The Arizona law is nothing less than a direct attempt to modify or supplement the federal statutes, which as construed act upon the same subject matter—the length and consist of interstate trains—and for the same purpose—safety—and impose limitations which conflict and are inconsistent with the arbitrary limitation imposed by the state.

**4. THE UNREASONABLENESS OF THE LAW AS
A PURPORTED SAFETY MEASURE
(Appellee's brief, pp. 78-93)**

In this portion of its brief, appellee argues the proposition that the validity of the law rests solely upon the determination whether, upon the whole record, it is possible to say that the law is without rational basis in safety, asserting that it has a rational basis and is therefore valid.

This entire argument depends upon the premise that the nature of the subject-matter regulated can be wholly disregarded; or, alternatively, that the subject-matter is of local concern and involves no national interest. We have shown that each of these premises is untenable.

Appellee's initial argument (its brief, pp. 80-84) is that the extent of the *burden* on interstate commerce need not be considered by the Court in determining the law's reasonableness under either the Commerce or the Due-Process Clauses. So far as concerns the Commerce Clause, this

argument is predicated upon appellee's view of the significance to be given certain expressions quoted from *South Carolina Highway Dept. v. Barnwell Bros.*, supra, (303 U.S., pp. 189-190). As already pointed out, in stating that it is a legislative and not a judicial function to determine whether the burdens imposed upon interstate commerce by state regulation are too great and should therefore be curtailed, the Court was careful to confine its reference to state regulations "otherwise permissible". It did not say that the courts might not consider the burdens imposed by state regulations operating in the exclusive national field, or which, though nominally of local concern, are in point of fact aimed at interstate commerce, or seek to subordinate the efficiency and convenience of interstate traffic to local requirements, or otherwise impose unnecessarily harsh restrictions. Since any regulation which directly burdens or impedes interstate commerce or substantially impairs the usefulness of the carriers' facilities employed in such commerce is invalid, it is clearly a judicial function to determine the nature and extent of the burden imposed and whether it falls within these descriptions. Such is precisely what this Court has declared that it must do, and has done, in cases arising both before and since the *Barnwell Case*: e. g., *Milk Control Board v. Eisenberg*, 306 U.S. 346, 352; *Parker v. Brown*, 317 U.S. 344, 362; *Terminal R. Assn. v. Brotherhood*, 318 U.S. 1, 8-9.

Appellee asserts (its brief, p. 80) that it differs greatly with appellant concerning the conclusion to be drawn from the evidence as to the extent of the burden shown, including the cost of compliance and the interference with opera-

tions. It also differs in this respect from both of the courts below. The trial court specifically found that in 1938 the direct money cost of compliance with the law was \$394,900, of which \$94,600 was incurred extra-territorially (R. 3968). The state supreme court apparently accepted this finding: for in its opinion (R. 4062), it stated that appellant is compelled "to expend great sums of money in order to comply with the restriction." That there is delay, congestion, and interference, and thus a substantial physical obstruction to the free movement of the interstate traffic carried in the affected territory, is also fully established, and would indeed be obvious: for the compelled operation of 28% more trains than necessary to carry the traffic inevitably multiplies the interferences due to meets and passes; while the necessary reconstituting of trains at and beyond the border cannot but result in serious delays.

In its argument respecting the consideration to be given to the burden due to the obstruction and cost of compliance, appellee relies upon *Erie R. R. Co. v. Board of Commissioners*, 254 U.S. 294, as later modified, so appellee says, by *Lehigh Valley R. Co. v. Board of Commissioners*, 278 U.S. 24. It disregards more recent decisions: *Missouri-Pacific R. R. Co. v. Norwood*, 283 U.S. 249, 255; *A. T. & S. F. Ry. Co. v. Railroad Commission*, 283 U.S. 380, 395, 396, in which, with the citation of earlier cases upon which we rely, this Court has declared that the cost of complying with state laws enacted to promote safety is an element properly to be taken into account in determining whether such laws are arbitrary and repugnant to the Due-Process Clause.

The comment in the *Lehigh Valley Case*, apparently limiting the effect of the earlier *Erie R. R. Case*, should not be interpreted as setting forth the *only* circumstances in which cost of compliance may be considered, but rather as describing one method of proving the unreasonableness of a regulation involving heavy cost. If the object may be achieved by other means but at much less expense, then a regulation compelling heavy expenditures is demonstrably unreasonable. But this is not to say, and we do not understand that the Court has said, that a regulation imposing relatively heavy expense and burden, for the sake of a comparatively minor safety advantage (or, as in this case, without such advantage but with actual detrimental effects), cannot be held unreasonable even though there is no alternative cheaper means of obtaining the desired result.

Appellee concludes upon this point by asserting (its brief, p. 83) that the object of the law is to protect against the dangers incident to the increase in train length, and that no other method has been shown which will accomplish this object. This assertion is without factual support and indeed wholly erroneous. Assuming, however, for argument's sake, in spite of the evidence to the contrary, that the object of the law is to increase railroad safety, as against supposed dangers from long-train operation: it is shown that other methods are available which do not involve the enormous dislocation of and burden upon through interstate transportation attendant upon the law, and which will accomplish, and in fact elsewhere in the United States have accomplished, all the claimed objects of the law. The substantial reductions (nearly 70%) in

the frequency of accidents and casualties to railroad employees, whether all classes be considered or only the more restricted groups claimed to be the principal beneficiaries of the law, which have attended the growth and development of the long-train operating practice, and the many improvements in the cars, locomotives, and fixed structures, and particularly in the brakes, couplers, signals and other mechanical devices and appliances especially connected with safety, eloquently attest the availability and effectiveness of these other methods; particularly when it is realized that the improvement in Arizona has been substantially less than nationally, or in the adjacent state of Nevada where substantially similar conditions, other than those created by or incident to the enforcement of the law, have existed through this same period (i.e., since about 1923).

If it can be said that the object of the law is to reduce the number and frequency of "slack-action" casualties, without considering others (and this appears to be appellee's argument, although obviously other casualties cannot be disregarded, because their frequency is directly affected by the law), the record still shows that this objective can be and has been attained by other means, not involving the cost and burden imposed by the law. For in Nevada appellant, by the use of improved equipment and other facilities and the adoption of modern operating methods, has reduced the frequency of slack-action casualties, in their relation to traffic handled, by more than 57%, comparing the earlier period of predominant short-train operation (1923-1928), with the latest period for which statistics were available (1935-1940):

whereas in Arizona, although conditions were substantially the same and the same improved equipment and appliances were in use, but modern operating methods could not be developed because of the law, the corresponding reduction in the frequency of these casualties has been but 47.7%. In Nevada, during the most recent 12-year period (1929-1940), with about five per cent more traffic volume than Arizona, there were on the average only 5.08 such casualties per year; in Arizona the average was 5.17 per year. It is apparent that without the law somewhat better results have been obtained, even considering only this class of casualties, than by observance of the law in Arizona. This, however, is, without regard to other classes of casualties, although the number and frequency of these is greatly affected and, as the trial court has found (R. 4021-4022), substantially *increased* by the law, because of the greater exposure of men, and the greater opportunity for accidents, created by the compelled operation of additional and unnecessary trains.

The operating methods used elsewhere, in territory not affected by the law, have accomplished more fully and more cheaply the object of reducing the number and frequency of railroad casualties, even including the particular type claimed to be the special object of the law; so that even by appellee's test, the law is wholly unreasonable under the Due-Process Clause.

II.

THE FACTUAL ISSUES

1. THE SIGNIFICANCE OF THE TRIAL COURT'S FINDINGS
AND THE STATE SUPREME COURT'S REFERENCE THERETO

(Appellee's Brief, pp. 11-13, 149-151)

Appellee's discussion of "the Trial Court's Findings and Judgment" (appellee's brief, pp. 11-13), and of the state supreme court's reference (R. 4067-4068) thereto in its opinion (appellee's brief, pp. 149-151) covers two phases of the same topic. Its position is rather equivocal, in that it appears to contend that the state supreme court, in reversing the trial court, at most set aside only those portions of the findings which are of "ultimate" facts; but it fails to specify which portions are, in its view, "ultimate", and which are "evidentiary", and, as it says, therefore "improper" (though *not* reversed).

When appellee took its appeal to the state supreme court, it did not assert that any of the findings were erroneous because "evidentiary" rather than "ultimate"; but specifically because each of the findings complained of was, as it said in its assignments, "based upon incompetent, irrelevant, immaterial, and inadmissible evidence improperly admitted and considered by the trial court, contrary to and not supported by the evidence, and upon an immaterial issue." Thus appellee conceded that the findings, if supported by legal evidence and upon a proper issue, were not otherwise objectionable because of so-called "evidentiary" content. Many findings which contain "evidentiary" material (as we understand appellee's use of the term) were not objected to: e. g., Findings III(a), III(b) (1), III(b) (2) (except in part), III(b) (3).

III(b) (4), IV(a), IV(b), VI(a) (except in part), VI(b) (except in part), VI(c) (except in part), VII(a) (1), VII(a) (2), VII(a) (3) (except in part), VII(a) (4) (except in part), XI(a), XI(b), XI(c), XI(d) (except in part), XII(a), XII(b), and XII(o) (1) (R. 3890, 3891, 3893, 3895, 3896, 3897, 3898, 3902, 3904, 3907, 3909, 3911, 3912, 3913, 3969, 3970, 3971, 3974, 3976, 4010).

As stated in our Opening Brief (Vol. I, pp. 12-14, 315-322), we believe that the expression of the state supreme court (R. 4067-4068), holding the findings and judgment of the trial court to be in error, cannot be construed as a blanket reversal of the trial court's detailed findings of fact. Certainly there was not, even upon appellee's theory, a disapproval of any findings other than those termed "ultimate" by appellee. In so far as the findings state the specific facts shown by the evidence, they are therefore unimpaired, and so may be accepted as a complete and adequate analysis of the testimony.

We do not subscribe to appellee's apparent view that even the so-called "ultimate" findings were intended to be reversed by the state supreme court. All of the findings are supported by the principle, embodied alike in the Arizona Rules of Practice (Sec. 21-1028, *Arizona Annotated Code*, 1939), and the federal rules (Rule 52(a)), that findings of fact shall not be set aside unless clearly erroneous, due regard being given to the opportunity of the trial court to judge the credibility of witnesses. The state supreme court pointedly failed to indicate any intention to depart from that rule. This Court has accorded great weight to such findings, especially, when not modified or reversed in terms by the inter-

mediate court: *Butte & Superior Copper Co. v. Clark Montana Realty Co.*, 249 U.S. 12, 30; *District of Columbia v. Pace*, 320 U.S. 698; and compare *Commissioner v. Scottish-American Inv. Co.*, No. 52, etc., Oct. Term, 1944 (Dec. 4, 1944).

Appellee also suggests (its brief, pp. 12-13, 151) that even if the findings were not set aside this Court is not bound by them but will examine the whole record upon the pertinent issues, citing *South Carolina Highway Dept. v. Barnwell Bros.*, 303 U.S. 177; *Clark v. Gray*, 306 U.S. 583. Neither of these decisions indicates that this Court will make an exception, in a case such as this, to the established principle of accepting the trial court's findings when supported by substantial evidence. In other similar cases, decided both before and since the *Barnwell Case*, this Court has held that such findings will not be disturbed: *Borden's Farm Products Co. v. Ten Eyck*, 297 U.S. 251, 261; *Atlantic, etc. Tea Co. v. Grosjean*, 301 U.S. 412, 420; *Alabama Power Co. v. Ickes*, 302 U.S. 464, 477; *Milk Wagon Drivers Union v. Meadowmoor Dairies*, 312 U.S. 287, 293; except that this Court, in the performance of its constitutional duty, will examine the record when it is properly asserted that a private litigant has been deprived of constitutional rights by reason of findings made by a state court claimed to be unsupported by and contrary to the evidence: the point presented by appellant's assignments Nos. 7 and 8 (our brief, Vol. I, pp. 322-330). Appellee apparently agrees (its brief, p. 151) that if the lower court's opinion, in spite of the apparently controlling reasons for a contrary view set forth in our brief (Vol. I, pp. 315-322), is to be interpreted

as a reversal of the trial court's findings of fact (not of law), appellant is entitled to a review of the evidence by this Court: compare its citation of *Truax v. Corrigan*, 257 U.S. 312, and *Norfolk and Western R. Co. v. Conley*, 236 U.S. 605. But neither these cases, nor any other decisions of this Court, conflict with the principle that findings of the trial court, if supported by substantial evidence, will be accepted as conclusive. These cases simply recognize an exception to that rule, when a *private litigant* claims a deprivation of federal right *by a state* because of "insubstantial findings screening reality" made by a state court. The state—the appellee here—cannot invoke that exception. It is available only to appellant; and it is invoked by appellant only if, and to the extent that, the state supreme court's opinion may be construed as a "finding of fact" differing from and contrary to the trial court's findings of fact, and therefore, as we insist, contrary to and unsupported by the testimony of record. Otherwise, and at all events from the standpoint of the state, the trial court's findings are complete, conclusive, and not now open to question.

Appellant therefore does not, as appellee asserts, complain that the state court failed to discuss the evidence or point out specifically the error as to each finding of fact. On the contrary, as appears very clearly from our Opening Brief (Vol. I, pp. 13, 329), we believe that the state court's opinion plainly shows that it did not consider the findings of fact to be in any respect an erroneous reflection of the facts developed by the evidence; that on the contrary, and in line with its own long-standing rule and the usual practice of appellate courts generally,

it accepted the factual findings since no error was clearly shown. It simply concluded, *as a matter of law and in spite of the facts*, that the challenged statute, which it held to have been enacted for the purpose of safety, was fortified by a presumption of reasonableness so strong as to render unnecessary any consideration of the facts as found.

Since it is not disputed, but on the contrary is clearly shown, that each of the trial court's findings is supported by substantial evidence and in practically every instance by evidence which is wholly unchallenged, they should and we are confident that they will afford the factual basis for the consideration and judgment of this Court.

2. "LOCAL CONDITIONS"

(Appellee's Brief, pp. 7-8, 39-40)

Commencing at page 7 of its brief, under the heading "Local Conditions", appellee attempts by reference to the record to support the argument that appellant's lines in Arizona are subject to local conditions affecting the operation of its trains, which differ from those obtaining in other states. Somewhat the same argument is also made at pages 39 and 40, where it is asserted that the "safety of long-train operation" (apparently believed to be the subject-matter of the law) depends to a considerable extent upon local conditions, "curves, grades, hogbacks, dips, sandstorms, and the like."

The facts, as found by the trial court (R. 3891-3897, 3902-3915, 3945-3946), and not challenged in or disputed by the state supreme court, show that appellant's lines in Arizona are not subject to any peculiar local conditions

affecting train operations, or any that differ substantially from those on the railroads in the other western states, except that the conditions in Arizona are in many respects more favorable to long-train operation.

While there is nothing in the record to show that the principal main lines of railroad in Kansas are "comparatively curveless", as appellee suggests, they cannot in this respect be much more favorable, if at all, than appellant's Arizona lines. The finding of the trial court is to the effect that in Arizona "curvatures are light, and curves are comparatively infrequent." 84% of the mileage on the principal main line in Arizona is straight track and, of the 16% which is curved, all but about 1% consists of curves of less than 6° (R. 3894-3895). On the alternate main line through Phoenix, 91% of the mileage consists of straight track. On the alternate main line through Douglas to El Paso, 82.5% is straight track (R. 3895). By contrast, only 75.5% of the Nevada main-line mileage is straight track, 24.5% being curved (R. 3897).

Moreover, all of these curves, where they occur in grade territory, are "compensated", so that they offer no more resistance to the movement of trains ascending the grades than results from the grade alone upon adjacent stretches of straight track. But such curvature, far from being a handicap to long-train operation, is actually a help; when trains pass around curves, the members of the crew in the engine and caboose can more readily obtain a complete view of the moving train, and on descending grades the resistance to wheel movement helps in controlling the speed.

The helper districts in Arizona, where additional engines must be used to move trains, are neither lengthier nor characterized by heavy grades. The maximum ruling grade upon any of the Arizona main lines is 1.4%, or slightly less than the maximum (1.5%) on the main line in Nevada. The clearness of the atmosphere, the general lack of foliage along the tracks, the absence of fog and smoke, and the normally mild winter weather, all make for relatively favorable conditions in Arizona. These conditions likewise prevail in Nevada (except that the winters there are more severe) and, as the Court will notice judicially, in those portions of New Mexico, western Texas, and southern California adjacent to Arizona.

The record shows, and the trial court found (R. 3915, 3937-3938, 3942), that long-train operation is being successfully conducted as a common, standard, daily practice, not only in the states adjacent to Arizona and in other western states, but throughout the United States generally, over railroads where the grades are more severe and the climatic and other conditions more arduous than any encountered upon appellant's Arizona lines. Ruling grades in California, upon certain of the main lines over which long trains are continually operated, are from 2% to 2.5%; the curvatures are at least as severe as any in Arizona (R. 2194-2197). Ruling grades on main lines in Arkansas (R. 2874), Montana (R. 2894), New Mexico (R. 2986), Pennsylvania and New York (R. 2862, 2933), Massachusetts (R. 2942), and West Virginia (R. 875), as to which specific testimony of long-train operation appears in the record, are about as heavy as in Arizona, and in many cases somewhat heavier. These grades evidently do not seriously impede long-train operation.

The extent of the grade territory in Arizona is not described by appellee, obviously because it is of such small importance. There are only 41.2 miles (32.2 opposed to eastward, and 9.0 opposed to westward traffic) upon the principal main line where the ruling grade of 1.4% applies. Elsewhere the heaviest ruling grade is 1.1%, and even this district is only 12 miles long. There are other short grades of approximately 1%; but by far the greater part of the lines, including all of the alternate main lines via Phoenix and Douglas, are in level territory, or with ruling grades not exceeding 0.6% in the case of the Phoenix line, and 0.8% in the case of the Douglas line (Finding III(b) (2), R. 3893-3895).

Appellee also speaks of "~~elevations~~" crossed by the Arizona lines; but the record (Ex. 155, 156; R. 3029, 3030) shows that the maximum elevation upon appellant's Arizona lines is approximately 4700 feet: much less than the maximum elevation upon the line in New Mexico east of El Paso (6600 feet), or in California (7000 feet), or Nevada (6300 feet). The greater portion of the Arizona line is below 3000 feet elevation. The line lies, for the most part, in comparatively level, desert territory where operating conditions are favorable. The other railroad lines which cross the continent through the states north of Arizona, upon which long-train operation is the customary practice, attain much higher elevations and are in generally less favorable territory.

Appellee also says (brief, pp. 7, 39) that Arizona is subject to sandstorms and strong wind conditions, asserted not to be present, at least to the same degree, in Nevada. The record does not show that sandstorms are

unusually frequent in Arizona, or that when they do occur they offer substantial hindrance to train operation, any more than in Nevada and other nearby states. Sandstorms and high winds are at least equally frequent in the adjacent desert portions of southern California and New Mexico, as well as in Nevada. The same traffic which, under the law, must be handled in short trains across Arizona, is handled in long trains, despite these sandstorms and high winds, in the adjoining districts in California and New Mexico.

It is true, and properly a matter of judicial notice, that Arizona's population is not as great as in many other states, although greater than in Nevada; but it is not shown of record, and is certainly not a matter of judicial notice, that Arizona's highways in the neighborhood of its larger cities (particularly Tucson and Phoenix, through which appellant's main lines pass) are any less heavily traveled than in many other states, or that the density of the traffic thereon is any greater or less than on the main highways crossing Nevada. There are several interstate highways crossing each state, which in normal times carry a large volume of through interstate automobile traffic, as well as considerable local traffic. The density of the traffic upon these highways is not controlled by and to some extent is independent of the density of the local population.

The local conditions in Arizona, so far as concerns appellant's train operations, are essentially similar to those encountered on the main lines of railroads throughout the United States. To the extent that there are differences they favor Arizona rather than otherwise.

Appellee refers (brief, pp. 39, 75, 102) to an accident occurring at Manor, Pennsylvania, on March 27, 1936 (R. 2213, 3329), as an example of an accident caused by a "local condition". In that accident a car in a train "buckled" and fell across an adjacent track; and the wreckage was struck by a passenger train moving on that track, resulting in 14 casualties. Accidents in which cars are buckled or otherwise thrown aside so as to foul adjacent tracks are not peculiar to long trains, as appellee seeks to infer, but also occur, and with at least equal frequency, on short trains (Ex. 312, R. 2266-2267). Moreover, this particular type of accident is exceedingly unlikely on appellant's lines in Arizona under either long- or short-train operations. Only 65.6 miles of the 808 miles of appellant's main lines in Arizona are double track; and of this total, the 39.7 miles between Tucson and Mescal consists of alternate, non-adjacent tracks, which are separated from each other considerable distances. Thus the extent of adjacent double track main line is but 25.9 miles, or about 3.2% of the total main line mileage.

Appellee's attempted emphasis upon the effect of local conditions upon the safety of operation demonstrates very forcefully the essential unreasonableness of the Train Limit Law. The law takes no account of any variation in conditions, either as between different sections of the line, or as between different periods of railroad development. It imposes a single fixed and arbitrary limit throughout the state, automatically violated if a longer train crosses the state boundary, or operates anywhere within the state. Changes in the conditions affecting train operations do not occur merely because the state

line is crossed. As appellee suggests (its brief, p. 39), a limit which might have some appearance of reasonableness in a difficult mountainous district could not be justified for application to through interstate trains operating under favorable conditions characteristic of appellant's Arizona lines. For similar reasons, this law, presumably addressed to conditions prevailing in 1912, is utterly unreasonable today because it fails to recognize the revolutionary changes in operating methods taking place since, as the result of improvements in locomotives, cars, and fixed properties, and the general progressive evolution of the railroad industry.

3. "BURDEN ON INTERSTATE COMMERCE"

(Appellee's Brief; pp. 8-10, 42-52)

At pages 8-10 of its brief, appellee summarizes its factual argument relative to the burden upon interstate commerce imposed by the law; this argument is elaborated at pages 42-52.

We emphasize again that, in attempting to show that enforced compliance does not impose substantial financial burdens, appellee disagrees with not only the trial court's finding (Finding X(d), R. 3968), but also the state supreme court's inferential adoption and approval thereof (R. 4062-4063). Upon this question there are thus affirmative "concurrent findings of the courts below" (*Just v. Chambers*, 312 U.S. 383, 385; *Texas & New Orleans R. Co. v. Railway Clerks*, 281 U.S. 548, 558, and cases cited); so that appellee's attempt to raise the point again in this Court is foreclosed.

(a) The Comparisons of Train-Length and Efficiency Trends (Appellee's Brief, pp. 42-47).

Appellee argues (brief, pp. 8-9, 42-46) that there is no evidentiary value to our showing of operating and transportation ~~expenses~~ for the years 1922-1939, wherein the trends are contrasted with those upon the Class I railroads of the United States as a group, upon various representative major systems separately, and upon appellant's system, and its lines in Nevada; because 1922, 1923, and 1924 were included in the base period 1922-1925, against which the improvements (decreases) in unit expenses in later years were computed. Its particular criticism is that the appellant's Arizona lines were greatly changed on November 1, 1924, by the acquisition of the El Paso & Southwestern and Arizona Eastern properties, so that the inclusion of the operating results for these lines in the Arizona totals after that date, but not before, produces an incomplete showing.

The comparisons in this series of exhibits are of *trends* of unit costs: i. e., *average* operating and transportation expenses per thousand revenue ton-miles; so that the criticism would be tenable only if the acquired lines were actually dissimilar, having operating and traffic conditions so widely different as to produce substantial disparities in unit costs. The fact is quite otherwise. These other lines are all in Arizona, and generally in the same districts, serving in fact many of the same localities, and subject to the same conditions of climate and terrain, and particularly to the train-limit restrictions. Operating conditions, from the standpoint of grades, curvatures, elevations, helper districts, etc., are somewhat

more favorable. On the former EP&SW line (now the alternate main line through Douglas), the ruling grade was and is 0.8%, and there are no helper districts (R. 3894, 3896). On the Arizona Eastern (now a part of the alternate line through Phoenix) the maximum grade is 1%, and the grades in general do not exceed 0.6% (R. 3894). Curvature was and is comparatively light. In general, the conditions on these lines resemble those prevailing on the former (and present) Southern Pacific lines west of Mescal, and particularly west of Tucson, and thus did not include even the slightly more adverse conditions on a part of the line east of Mescal.

Comparisons of operating results, in terms of unit costs, on the Southern Pacific in Arizona before and after the acquisition, show that appellee's criticism is without substance. The following is taken from Exhibit 160 (R. 3034):

Years	Revenue ton miles (in freight and mixed trains)	Freight Operating Expenses	Freight Transportation Expenses	Averages for 1000 Revenue Ton-Miles	
				Freight Operating Expenses	Freight Transportation Expenses
1925-1928	6,292,063,760	46,337,346	20,606,596	\$7.38	\$3.28
1922-1924	2,994,341,655	21,996,747	9,162,381	7.34	3.06
Per cent increase 1925-1928 over 1922-1924				0.54	7.19

Appellee's willingness to be bound by trend showings based upon results during the years 1925-1928 (see pp. 44-46 of its brief) is explained by the fact that commencing in 1923, and as soon as 1928, many railroads had substantially accomplished the inauguration of their long-train programs and achieved the attendant operating economies. For instance, as to those roads selected by appellee, we have:

	<u>Ex. No.</u>		<u>1922</u>	<u>1924</u>	<u>1926</u>	<u>1928</u>
S. P., Nevada	) 150	Average cars per train	48.9	54.4	66.1	68.5
	) 161	Transportation expense per				
	)	1000 revenue ton miles	\$3.45	\$3.07	\$2.53	\$2.61
C. B. & Q.	) 103	Average cars per train	41.5	44.5	48.5	50.9
	) 102	Transportation expense per				
	)	1000 revenue ton miles	\$3.96	\$3.48	\$3.17	\$3.02
Erie	) 56	Average cars per train	49.8	55.0	57.4	68.0
	) 54	Transportation expense per				
	)	1000 revenue ton miles	\$4.68	\$3.70	\$3.71	\$3.59

While the comparisons of operating results in Arizona with other parts of appellant's system, and with other lines, are perhaps not *ideal*, reason does not permit us to close our eyes to developments elsewhere, and decline to seek to determine what might happen in Arizona if the restraint of the law were removed. When the same results are noted in separate instances, but in the presence of the same common factor, those results should logically be ascribed to that factor. The following tabulation affords an example of the operation of that principle; and far from indicating, as appellee contends, that improvements in efficiency and unit costs are unaffected by increases in train length, it shows precisely how that factor has operated:

TABLE A

/ average Freight Transportation Expenses
Per 1000 Revenue Ton Miles

Exhibit Nos.	Railroad Company	Train Length—Cars				Percent Increase 1939 over 1922				Percent Decrease 1936-9 under 1922-5			
		1922	1930-1932	1939						1936-1939	1930-1932	1922-1925	1922-5
28	Illinois Central	42.7	44.6	40.0	46.1	8.0				3.16	3.31	3.26	3.5
130	Santa Fe	41.5	51.3	44.4	45.9	10.6				3.24	3.20	4.00	13.0
102	Burlington	41.5	51.5	43.2	46.3	11.6				3.18	3.00	3.63	21.2
11	New York Central	49.0	57.4	53.6	55.2	13.7				3.71	4.00	4.31	20.9
94	Milwaukee	37.8	46.7	41.6	45.8	21.2				3.59	3.65	4.16	18.5
59	St. Louis Southwestern	36.9	45.4	39.5	45.1	22.2				3.20	3.79	4.19	31.8
51	Rock Island	32.4	41.8	37.8	39.9	23.1				3.86	3.90	5.03	16.2
48	Northern Pacific	39.5	46.9	42.1	49.9	26.3				3.30	3.77	3.94	30.1
20	Class I—U. S.	35.4	48.9	44.8	49.1	27.9				3.48	3.52	4.16	23.6
24	Missouri Pacific	35.2	47.9	41.9	46.6	32.4				3.52	3.22	4.35	3.04
78	U. S. Pacific	28.1	53.2	50.2	50.5	32.5				3.43	3.23	3.90	23.3
54	Great Northern	49.8	71.9	67.4	67.4	35.3				3.32	3.52	3.93	15.5
46	Chicago Northwestern	41.0	53.4	42.4	56.0	36.6				3.35	2.85	3.78	30.2
63	Chicago Northwestern	33.4	42.6	39.0	47.5	42.2				4.13	4.52	5.18	20.3
120	Chesapeake and Ohio	51.9	66.2	73.6	79.5	53.2				1.21	1.43	2.06	37.4
67	Pennsylvania	40.8	58.0	55.4	63.5	55.6				3.22	3.63	4.35	28.3
186	Boston and Maine	31.3	49.7	48.2	51.1	63.3				5.06	5.79	7.64	33.8

(For Comparison)

151	Southern Pacific	43.4	52.5	49.5	54.6	25.8				4.40	4.34	5.03	21.5
150	Southern Pacific—Nevada	48.9	77.2	81.0	78.5	30.4				2.59	2.26	3.12	24.4
149	Southern Pacific—Arizona	55.8	56.4	56.8	54.8	1.2	Dec.			3.11	3.40	3.22	6.8

This tabulation summarizes and briefs the train-length and expense exhibits, and compares appellant's Arizona lines with other lines and railroads, the several roads being shown in ascending order of percentage increases in train length, 1939 over 1922. Average train lengths increased substantially during the period between 1922 and the years 1930-1932, and during that period the cost indices showed marked improvement; while since 1930-1932 train lengths have shown considerably less fluctuation, and the same indices have shown correspondingly less improvement.

The tabulated figures very definitely establish, *first*, that freight transportation expenses vary inversely with train lengths, and, *second*, that reductions in freight transportation expenses, and increases in efficiency, as measured by performance, have occurred on other railroads, outside of Arizona, coincident with and as a result of increases in train lengths, but such improvements have not occurred in Arizona.

At page 46 of its brief appellee presents excerpts from another series of exhibits, showing the efficiency index "gross ton miles per freight train hour" for Arizona, in contrast with four other western railroads. As with the cost exhibits, appellee's selection is favorable to its position because its base year is 1930, when the long-train program was well established on the other roads, but of course not in Arizona, although operations there could and did receive the benefit of practically all the other improvements in facilities and practices applied during those years. The following is a summary of *all* of this

group of exhibits, which compares the trend of the Arizona performance (in gross ton miles per train hour) with the same 16 other railroads shown above, the Class I roads of the United States as a group, the appellant's system, and its lines in Nevada:

TABLE B

Exhibits	Railroad Company	Train Lengths—Cars			Gross Ton Miles Per Freight Train Hour				
		1924	1930-1932	1939	% Increase 1924-1939	1924	1930-1932	1939	% Increase 1924-1939
130, 131	Santa Fe	46.6	51.3-44.4	45.9	—	22,887	31,115-29,492	35,471	55
28, 29	Illinois Central	44.7	44.6-40.0	46.1	3	20,319	24,963-24,411	29,934	47
102, 103	Burlington	44.5	51.5-43.2	46.3	4	20,239	26,140-24,048	32,145	59
11, 12	New York Central	51.3	57.4-53.6	55.2	8	22,471	31,155-32,099	37,184	65
94, 95	Milwaukee	41.8	46.7-41.6	45.8	10	17,492	23,458-23,470	29,770	70
78, 79	Union Pacific	45.0	53.2-50.2	50.5	12	23,804	33,267-33,539	43,006	81
51, 52	Rock Island	35.7	41.8-37.8	39.9	12	15,813	22,051-22,049	28,131	78
48, 49	Northern Pacific	34.4	46.9-42.1	49.9	15	20,961	24,848-24,311	32,408	55
20, 22	Class 1—U. S.	41.7	48.9-44.8	49.1	18	18,257	25,837-26,042	32,808	80.8
24, 25	Missouri-Pacific	39.6	47.9-41.9	46.6	18	16,714	26,722-26,403	33,356	100
46, 47	Great Northern	47.6	53.4-42.4	56.0	18	20,748	28,021-24,991	35,462	71
59, 60	St. Louis Southwestern	38.2	43.4-39.5	45.1	18	16,968	24,614-24,227	32,745	93
54, 56	Erie	55.0	71.9-67.4	67.4	23	24,239	36,906-38,730	45,742	89
63, 64	Chicago & North Western	36.7	42.6-39.0	47.5	29	15,502	20,775-20,772	29,642	91
67, 68	Pennsylvania	43.5	58.0-55.4	63.5	46	18,150	29,661-30,942	39,244	116
86, 87	Boston & Maine	34.3	49.7-48.2	51.1	49	12,575	21,993-23,031	27,186	116
120, 121	Chesapeake & Ohio	53.5	66.2-73.6	79.5	49	22,366	39,020-46,689	54,855	145

(For Comparison)

180, 193	S. P.—Tucson Division*	58.8	61.0-60.7	59.8	33,836	41,952-38,787	47,680
180, 193	Southern Pacific—Pac. Lines*	52.0	58.5-55.9	60.1	23,508	32,088-34,005	41,886
180, 193	S. P.—Salt Lake Division*	57.6	78.1-81.0	85.4	34,058	53,046-58,669	72,955

(*) (Main Line only—All freight trains.)

This summary differs slightly from the preceding, for 1924 is the base year, 1922 statistics not being available for the Southern Pacific divisions necessarily used; and the Tucson and Salt Lake divisions are used instead of the states of Arizona and Nevada. The Tucson Division lies almost wholly within Arizona and includes a large percentage of the Arizona mileage. Its operations are completely governed by the law. The Salt Lake Division includes practically all of appellant's lines in Nevada, and extends to Ogden, Utah. Statistics are for *main line* operations only, on the three Southern Pacific showings; but there can be no criticism on this score, because the exclusion of branch line operations for the Tucson Division (Arizona) showing produces a result slightly more favorable to appellee's contention.

Here again the dominant, controlling factor is revealed to be train length. Increasing efficiency goes hand in hand with increasing train length. The periods of long-train development as to certain lines are pronounced, and so are the corresponding improvements in efficiency. The showing is consistent, cohesive, persuasive, and unimpeachable that increasing train lengths are largely responsible for increasing efficiency on other lines, but the law places a permanent barrier against ever achieving comparable improvements in efficiency in Arizona.

The acquisition of the EP&SW and Arizona Eastern in November, 1924, becomes wholly immaterial when *Tucson Division* statistics are used, because the division accounts for 1924 were "restated" when the 1925 figures were compiled, so as to cover the same lines as in 1925.

and only these 1924 "restated" figures are used in the summary.

Appellee's brief (pp. 46, 47) presents the following tabulation and observation:

"Gross ton mile per freight train hour

Railroad	1930	1939	% Increase
Great Northern	28021	35462	26.5
Northern Pacific	24848	32408	30.4
Union Pacific	33267	43006	29.3
Santa Fe System	31115	35471	14.0
S. P.—Arizona	35087	45026	28.3

"The increase in gross ton miles per freight train hours—the yardstick of efficiency—is seen to be comparable to that on other western roads."

Appellee's purpose is to show that appellant in Arizona can register as good a performance as other western railroads not affected by the law, and thus to prove indirectly that the law is not a deterrent, efficiency-wise. This analysis has its place in the consideration of this case, but appellee's conclusion is completely erroneous. The reason for the parallelism between the Arizona lines and the other railroads is that these roads, having effectuated their long-train programs prior to 1930, were influenced by forces also active in Arizona, and the results were similar. The average cars per train for these lines, excerpted from preceding tabulations, were as follows:

	Train Lengths—Cars	
	1930	1939
Great Northern	53.4	56.0
Northern Pacific	46.9	49.9
Union Pacific	53.2	50.0
Santa Fe System	51.3	45.9
S. P.—Arizona	56.4	54.8

As pointed out heretofore, the Arizona lines do respond to and are affected by other economic influences and stimuli, which also make themselves felt in the other parts of the nation's railroad system.

Appellee's meager showing only emphasizes the situation presented in full by the two summaries above set forth, based upon *all* of the expense and efficiency exhibits which compare the Arizona lines with other lines and railroads. Appellee's own reasoning likewise negatives its contention that conditions in Arizona are so different, or on the lines acquired in 1924 (the EP&SW and Arizona Eastern) were so different, as to render comparisons with other railroads of no value, or support the view that the law itself responds to some distinctive "local condition". An opposite conclusion must be drawn: specifically, that controlling conditions on the Arizona lines, and on other lines, are so much alike that *all* lines in the country, both in Arizona and in the other states, respond to the same stimuli, and are truly comparable as to those situations which are pertinent and worthy of serious consideration. Any differences which may exist between Arizona and other lines are trivial and inconsequential, and asserted by appellee only for the sake of argument: for there are no special "local conditions" (apart from the challenged law) which distinguish railroad operations in Arizona from those in other states, for any purpose of this case.

(b) The Redispatching Studies (Appellee's Brief, pp. 47-52).

At pages 47-52 of its brief, appellee criticizes the redispatching studies presented by appellant, and accepted

(as noted) by both the courts below as showing the recurring annual out-of-pocket expense of compliance with the law. Appellee asserts that whatever savings are shown by the redispatching study could have been realized regardless of the law, by merely substituting larger power (400 or AC-type engines) for the smaller engines actually used on the short trains run. Appellee is correct, *but only in part*; for it does not develop all that its argument implies.

At this point a brief review of appellant's "burden" showing is desirable. *First*, by comparison of cost and efficiency indices, appellant has shown that the Arizona lines lag far behind rail lines elsewhere in the country in reductions in cost and increases in efficiency. These benefits are still attainable in Arizona by removal of the law's restrictions. *Second*, by an entirely independent avenue, appellant made an accurate determination of the savings which could have been realized in the years 1938 and 1940. This was the result of the redispatching studies, which developed how many less trains, train miles, and locomotive miles would be required to move the same business; and applied known cost figures to the operational savings thus determined. By these two separate approaches—*independent, yet each confirming the other*—appellant has presented a balanced and integrated showing of burden which is conclusive and inescapable.

Appellee, at pages 47-48, attacks one detail of the redispatching study: the substitution of larger power on the redispatched (long) trains, for the smaller power actually used on the short trains. The essential place that larger power has in the long-train program was

developed by appellant's witness, Dr. Parmelee (R. 189-190):

"Railroad executives of Class I railways in the spring of 1923 formulated and inaugurated a continuing program designed to rehabilitate and modernize the entire rail plant. *This involved not only the physical fitness of the plant but also an increase in the unit output of rail facilities.* The primary objective of the program was to provide equipment and facilities capable of handling mass transportation with the smallest possible number of units, that is, cars and trains. *To that end railroads installed new locomotives and cars of modern design and greater unit hauling and carrying capacity.* They retired obsolete equipment units from service. They laid millions of tons of heavier rail. They renewed and strengthened roadbeds. They reduced curves and grades. They rebuilt or replaced bridges, trestles and culverts. They greatly extended signalling systems and safety devices. *In every way they remodelled the rail plant to permit, where conditions were favorable, use of trains of greater carrying capacity and moving at a greater average speed between terminals.* During the first year of the improvement program, 1923, more than \$1,000,000,000 of gross expenditure was made on capital account. During the 17 years ending with 1939 the total was approximately \$9,000,000,000." (Emphasis supplied.)

The place that this larger power would have in long-train operation in Arizona is stated in Finding IX(b) (R. 3949):

"... In order to conduct long freight-train operations in the affected territory with greater efficiency and economy, and with due regard for schedule re-

quirements, and to realize thereby a larger degree of use and usefulness of its entire railroad plant in said territory, defendant plans and intends to provide and assign to such freight-train operation an adequate number of locomotives having sufficient tractive power more readily to handle long freight trains in both directions in said territory. Such locomotives, when so assigned, will replace certain of the other locomotives now in use in said territory. Of all of the types of locomotives owned and operated by defendant, the Articulated-Consolidation type is most suitable to such long-train operation. Locomotives of class 8 of the Articulated-Consolidation type, for brevity known as AC-8 locomotives, have been in service on various portions of defendant's lines since 1939. . . . In order to handle, in long-train operation, the same volume of freight traffic actually handled in the affected territory in 1938, defendant will be required to assign some thirty AC-8 locomotives to said service"

Appellee points to certain data on Exhibit 198 (R. 2115), and then proceeds to draw wholly unwarranted conclusions, primarily based upon its understanding of appellant's statement that Exhibit 198 is "representative" of the 900 work sheets which together contain the details of the 1938 redispatching study. Appellee's observations in this respect are a mixture of misunderstanding and unwarranted assumption. Exhibit 198 is only a sample, *representing the form* of the work sheets, and shows how the arithmetic was developed on each of the 900, so as to obtain the daily totals of locomotive miles, train miles, cars, and wages for actual and redispatched operations. It indicates the methods by which were solved the

other 899 problems of making long trains out of short. However, it covers *only eastbound* trains moving on June 18, 1938, over the district from Tucson to Lordsburg, and so does *not* reflect actual conditions on the other districts involved (Yuma-Gila, Gila-Tucson, and Lordsburg-El Paso), or present any of the details appearing on the 600 or more work sheets covering those districts.

No railroad with due regard for efficiency and economy would consider using AC-8 locomotives on short trains in the districts west of Tucson or east of Lordsburg; no such use was contemplated in the redispersing study. An AC-8 locomotive, without helper, could handle the short train Y-311 efficiently over the 1.4% ruling grade between Tucson and Lordsburg, but it would be a gross waste of power to use it on that train, under the 70-car restriction, over the 1.02% ruling grades between Yuma and Tucson, or the 1.0% ruling grades between Lordsburg and El Paso (Ex. 155, R. 3029).

Appellee argues at length (its brief, p. 48) that if AC locomotives had been used on the actual trains shown on Exhibit 198, substantial savings in wages for the engine crews, and in locomotive fuel, maintenance, repairs, and other expenses would have been realized, as well as the elimination of delays necessary to cutting in and cutting out helpers and certain delays at water stops, and contends that the entire saving claimed by appellant could have been made simply by the use of these larger locomotives upon the short trains actually operated in conformity with the law.

An analysis of appellee's claims with regard to wages alone demonstrates that they are quite unfounded. From

Exhibits 198 and 209 (R. 3193) the results of its plan may be compared with the results of the redispaching study, as follows:

	Actual	Redispatch	Appellee's Plan
Wages of Train Enginemen.....	\$237.49	\$206.05	
9 x \$29.22.....			\$262.98
Wages of Double Header Enginemen.....	26.22		26.22
Wages of Helper Enginemen.....	187.58	133.05	
4 x \$15.01.....			60.04
Wages of Train Crews.....	401.67	312.67	401.67
Wages of Flagmen.....	27.29	6.57	—
Deadheading.....	29.86	—	29.86
	\$910.11	\$658.34	\$780.75
Saving.....		251.77	129.36

This appellee's plan would be, *as to wages only*, about half as effective in the Tucson-Lordsburg district where helpers are used.

Appellee concedes that the use of larger locomotives would save delays because of fewer stops for water and to cut helpers in and out, and would also save locomotive fuel, maintenance, repairs, and other expenses, but insists that none of these savings may be credited to long-train operation. It cannot avoid the fact, however, that the wage expense is by far the largest direct expense associated with the train operation; and that the operation of fewer trains means a corresponding reduction in this item of expense. It likewise cannot avoid the fact that the substitution of larger locomotives, if trains are limited by law so that the same number must be run, will result in increased wage expense for engine crews, because their wages are based upon the size of the locomotives operated (Exhibits 198, 209); but if fewer trains are operated and fewer locomotives run, this expense is cut down even though the locomotives are somewhat larger.

In fact, as demonstrated by Exhibit 198, a comparatively small wage saving might be realized by substituting larger power for the smaller now used in *helper territory*, where such substitution would reduce total locomotive mileage; and exactly the same character of saving, but in much greater measure, could be achieved by reducing the locomotive mileage in *all* of the affected territory, through the operation of fewer and longer trains. In *non-helper territory*, there would be no saving in wages of engine crews, if short-train operation were continued but with larger power, because no engine mileage would be saved. There would be no saving in wages of train crews, because no train mileage would be eliminated; and there would be absolute losses in locomotive-repair and fuel-consumption expense, because of the inefficiency of operating the large engines at a fraction of their capacity.

At pages 51-55 of its brief, appellee attacks our fuel saving figures, and particularly the estimated 10 per cent saving which was applied against June and August, 1938, fuel consumption between Yuma and Lordsburg to produce a part of the \$400,000 per year cost of compliance (see pp. 121-122 of Vol. II of our opening brief).

There is no inference or speculation involved in the fact that long-train operation reduces the number of trains operated and increases the ton-mile production per locomotive. Experience elsewhere in the United States, on appellant's lines in Nevada, and upon the system, indicates the approximate measure by which fuel consumption is reduced when locomotive output is increased. It is impossible to conclude that similar additional fuel economies could not also be achieved in Arizona.

Appellant objects, however, that the showing of savings in fuel expense is to some extent based upon comparisons which relate to the period prior to 1930, and claims that because of the change in the Tucson Division limits in that year, prior experience is of no value. But practical common sense and judgment cannot be circumscribed by such narrow criticism.

Between 1924 and 1930 there were substantial increases in train lengths, and in tonnages handled by locomotives, on the Salt Lake Division, accompanied by marked reductions in average fuel consumption per unit handled. Over the same period there were slight but noticeable reductions in average train lengths, and in tonnage per locomotive, on the Tucson Division. The decrease in average fuel consumption was very much less than on the Salt Lake Division, which result can only be due to appellant's inability to increase the output per locomotive on the Tucson Division. Efforts to increase the train loading on the Salt Lake Division continued after 1930 and up to the present, with corresponding decreases in fuel consumption. The Tucson Division operation in 1930 and thereafter was still restricted by the Train Limit Law; and its improvement in fuel consumption per unit handled was less than on the Salt Lake Division, in this second period (1930-1939), as well. The technical improvements in locomotive construction in the period 1924-1939, as well as other improved methods of railroad operation, resulted in reductions of average fuel consumption on both divisions; but there still remains to be realized, on the Tucson Division, fuel economy comparable to that already achieved, on the Salt Lake Division, as a result of the increases in train length and locomotive loading.

The percentage of the improvement in fuel economy thus available was quite accurately determined, by comparing the Tucson Division performance in each of the two periods with the corresponding performance on the Salt Lake Division. This method eliminates any change in Tucson Division performances incident to the change of division limits in 1930. It also, incidentally, makes use of the Tucson Division figures as *restated* for 1924, thus eliminating any disturbing effect caused by the acquisition of the El Paso and Southwestern and Arizona Eastern properties.

The change in division limits in 1930, which added to the division approximately 160 miles of railroad between Tucson and Lordsburg, cannot change the fact that in Arizona there had been no increase in train length, and no resulting reduction in average fuel consumption, in the six years immediately preceding. That change does not cancel out the fact that there had been a considerable increase in train length and locomotive loading, and a considerable decrease in fuel consumption, on the Salt Lake Division over the same period. Appellee in Arizona has never had an opportunity to increase its train lengths and locomotive loadings; and these improvements in efficiency, with resulting decreases in fuel consumption, are still to be realized. The possible fuel saving has been conservatively estimated to be at least 10 per cent of the fuel consumed under the short-train restriction.

Appellee asserts that the paired track arrangement with the Western Pacific in Nevada, begun in 1925, is one reason for casting out this comparison, because the reduction in train stops results in fuel economy not attainable

in Arizona. If the law were to be set aside, a large percentage of train stops would be eliminated in Arizona also, due to the smaller number of trains operated, so that corresponding fuel economy would be attainable (Finding X(b), R. 3953-3962).

Appellee points to inequalities assertedly appearing in fuel consumption rates when set beside average train lengths on the Salt Lake Division, claiming that there is no consistency in the showing. A single year's results may be unsatisfactory for a variety of reasons—weather, to mention only one—and appellant has consistently followed the practice of averaging two or more years for comparative purposes in order to eliminate, so far as possible, such periodic inequalities. However, appellee cannot successfully maintain that there has not been a definite long-time trend downward in the rate of fuel consumption on the Salt Lake Division, side by side with increasing train length.

Appellee ascribes a part of the Salt Lake Division fuel economy to abandonment of 151.85 miles of branch line between 1936 and 1939. There were also branch line abandonments in Arizona, during the period of the fuel studies (Exhibit 171, R. 3045); but it cannot seriously be contended that the amount of fuel used on branch lines, later abandoned, would materially affect the rate of fuel consumption.

We call attention to Exhibit 249 (R. 3258) showing that the difference between percentages of decrease on the Tucson and Salt Lake divisions is 13.44. To be conservative, appellant used 10%, recognizing that the information developed had been affected by a variety of factors;

among which, however, train length had played the dominant role. Appellant did not rely upon the Salt Lake Division showing alone for establishment of a fuel economy percentage; for the system's fuel economy during the same years had exceeded that on the Tucson Division by 9.76%.

Finally, as a test of appellee's sincerity in contending that improved economy does not follow from adoption of long-train operation, consideration should be given to the following paragraph (p. 51 of its brief):

"Also it will be noted that the average tractive power on the Salt Lake Division was increased from 55162 tons in 1936 to 62423 in 1939, an increase of 7261 tons.¹ The use of these heavier locomotives, such as the 4100 or A.C. type, was a material aid in the decrease in fuel per 100 gross ton miles—first by eliminating the necessity of many helper engines, and, second, by reason of the larger water capacity of their tender they can run further without the necessity of stopping for water."

From 1936 to 1939, the average freight cars per train on the Salt Lake Division increased from 72.9 to 79.8, all the efficiency factors showed improvement, and this was all apparently due (as appellee concedes) to the assignment of heavier power, and the resulting further expansion of the long-train program (R. 3038). There is no possible reason for believing that the same results would not follow in Arizona.

¹The figures in this sentence are correctly quoted from line 5 of Ex. 164, R. 3038; but the unit should be *pounds*, not *tons* as stated by appellee. The largest locomotive operated by appellant (the AC-9 class: Ex. 5, R. 2855) has a tractive power of about 62 tons (124,300 pounds).

4. THE TRAIN LIMIT LAW HAS NO RATIONAL BASIS AS A SAFETY MEASURE

(Appellee's Brief, pp. 10-11, 93-148)

Appellee's "safety" discussion extends from pages 93 to 147 of its brief, being summarized at pp. 10-11, and again at pp. 147-148. It consists principally of an attempted analysis of certain portions of appellant's testimony, with some references to appellee's own showing, and a great deal of comment which is either contrary to the evidence or has no relation at all to the record.

Appellee's treatment of the safety issues is noteworthy because *first*, it disregards, so far as possible, all types of accidents and casualties except the so-called "slack-action" group: i.e., those ascribed to "sudden stop, start, lurch, or jerk of the train or car"; *second*, it attempts to minimize even slack-action casualties, unless occurring upon "long" trains; and *third*, it contains almost no references to the detailed safety findings of the trial court (Findings XI, XII, XIII; R. 3969-4032).

Apparently it is appellee's position that the law, as a claimed safety measure, is concerned with casualties of only one type ("slack-action"), and even with those only when occurring on "long" trains; and that the trial court's safety findings, though not in terms reversed or set aside by the state supreme court, should now be disregarded.

The claimed safety purpose of the law cannot be so narrowly confined. As a purported safety statute it has no standing if it is merely a "slack-action" prevention law, and at the same time actually increases other hazards of railroad operation. Appellee, at the outset of its dis-

cussion, declares that the purpose and effect of the law are "to protect against the dangers incident to the increase of the number of cars in trains operated." But it is not claimed that the law prevents, or even measurably reduces, the *frequency* of *any* class of accidents or casualties; or that, *all* hazards considered, its observance results in greater safety of railroad operation; nor does appellee now deny or challenge the conclusion stated by the trial court, and independently presented by other parties now appearing in this case (i.e., the United States, and the Association of American Railroads, as amici curiae) as well as appellant, that the restricted operation under the law is *more* hazardous, all casualties considered, than if the same traffic were handled in an unrestricted—i.e., "long-train"—operation. On the facts that argument could not be maintained; and for this reason apparently, appellee stakes its whole case upon slack-action and attempts to dismiss from consideration as many of the other classes of hazards and casualties as possible, asserting that they are not affected by train length, or otherwise are immaterial.

As anticipated, appellee emphasizes its theory that from the standpoint of safety the essential question is whether accidents are more frequent and serious on long than on short trains. We have already pointed out (our opening brief, Vol. I, pp. 203-204, 312), that the issue cannot be thus restricted. As the trial court said (R. 4052):

"Essentially the question is not whether a given number of long trains may be operated with fewer casualties than an equal number of short trains, but rather whether the long-train method of moving the entire volume of traffic results in fewer casualties,

of all classes, than the movement of the traffic in a larger number of trains of restricted length."

The testimony establishes and, as we emphasize, appellee offers no serious challenge, that that method of operation which permits the traffic to be handled with as few train units as consistent with economy and efficiency, and therefore exposes as few employees as possible, creates far less hazard and causes many fewer casualties than does the restricted operation; or, as the trial court said (R. 4052-4053), when the "overall result in casualties of the entire operation" is considered it is clear "that the law not only does not increase safety of train operations in Arizona, but that as a matter of cold fact it makes these short train operations more dangerous"; hence, the "law not only bears no reasonable relation to safety, but to the contrary does, and if enforced will continue to, impair and lessen substantially the safety of (appellant's) train operations in Arizona and the adjacent affected territory."

(a) "Slack-Action Accidents and Injuries" (Appellee's Brief, pp. 93-99).

Even as a purported slack-action prevention measure, the law has no real merit or true relation to safety; for in this field it takes into account only one of the numerous factors which control the occurrence and severity of the slack-action shocks experienced in train operation and wholly disregards the others, although these are in most cases of much greater consequence.

Appellee would have the Court believe that the length of the train, and that factor alone, determines whether a slack-action shock will be sufficiently severe to cause dam-

age or injury. The evidence, however, shows, and the trial court found, in a finding (No. XI(d), R. 3971-3972) not heretofore or presently challenged by appellee in these particulars, that the occurrence and severity of slack action depend also, and in much greater degree, on: (1) the *speed* of the train at the time; (2) whether it is *accelerating* from a start, or *slowing down*, or proceeding at *normal speed*; (3) the *grade* upon which it is moving; (4) whether it is going *with* or *against* the grade; (5) whether the cars in the train are *loaded* or *empty*; and (6) if partly loaded and partly empty, the *placement* of the loads and empties with relation to each other.

The trial court also found (R. 3973) that the extent and amount of slack action in a freight train are to a large degree within the control of the engineer, through the use of air brakes and the engine power; and that it was not true, as appellee had apparently contended (and now contends: its brief, pp. 93-96) that the amount and severity of slack action occurring in a train depend solely upon the number of cars. That contention, said the trial court, fails to take into account any of the other factors affecting slack action shocks and the severity thereof; particularly, "grades, speed of trains, consist of trains, whether the cars therein are loaded or empty, and if loaded, the weight of the loads, and the control exercised and exercisable by the engineer" (R. 3973).

Appellee quotes (its brief, pp. 93-96) from the air brake instruction books, issued by appellant and the Santa Fe to engine service employees, asserting (p. 96) that by these instructions definite and distinct recognition is given to the danger from slack action in train operations, and

that this danger increases with train length; that the longer the train the greater the care required, "because the greater the difficulty in controlling the slack"; that the law is based upon the very proposition stated by the railroads themselves, that as the length of the train increases the care required to control the slack increases, and therefore the danger from slack action; but as appellee alleges (its brief, p. 100), the law "says that with over 70 cars in the train the care required becomes too great for safe operation."

This argument has no substantial foundation. These instruction books tell the employees that greater *care* is required in handling longer trains with heavier locomotives, and instruct the engineers how to exercise that care and employ the air brakes and the engine power to obtain safe control. The instruction books likewise recognize, although appellee apparently does not, that effective control of the train, including the slack and the slack action, can be obtained by the engineer, through the use of the brakes and the engine power, if the instructions are fully followed; that the *weight* of the train and the *grades* over which it travels, are factors determining the extent and severity of the slack action.

Neither of these books declares, either in terms or by reasonable inference, that there is any greater *difficulty* in handling of a long train, provided adequate *care* is exercised. Appellee's suggestion to this effect is not supported by the testimony of its own witnesses. None of the engineers called by appellee asserted that he had ever handled a train, either long or short; that he could not control. Engineer Kennedy admitted that he had had no

difficulty in controlling the long trains operated by him over the grade territory in Arizona during April, 1940, that he had accomplished this handling without any trouble because he had intended to do so (R. 2434-2435). Engineer Cooper, who is employed by the Santa Fe and has seniority permitting him to run in freight service, according to choice, in either Arizona (short train territory) or California (long train territory), voluntarily elected the latter, apparently because he preferred the job (R. 2438-2440). Engineer Stevenson, employed by the Southern Pacific, has the same election as between Arizona and New Mexico, but for many years has by preference operated in the latter territory (R. 2488-2489). Appellant's engineer witnesses (Messrs. Fifield and Menzies), who had long experience in train handling and the observation and supervision of other engineers, showed by their testimony that appellant's engineers generally have no difficulty in handling freight and passenger trains of all lengths, including those much longer than 70 or 14 cars, and that long trains are not more difficult to handle and control than short trains; in fact, engineers who as a regular practice handle long trains will frequently take more care than usual when occasionally called upon to handle short trains (R. 2785-2806, 2814-2817).

A complete answer to appellee's suggestion is found in the actual operations of April, 1940, when 302 long freight trains were operated on appellant's lines in Arizona, and wholly without any difficulty of handling so far as the record shows. If the engineers on any of these trains had experienced any difficulty or lack of control, appellee would have made the most of it in evidence. As

to certain of these trains the testimony affirmatively shows, by the statements of the very men who handled or rode upon them, that no such difficulties were experienced (R. 2435, 2815). No reportable accident or casualty attributed to either slack action or any other cause, occurred upon any of these long trains while in motion.

Appellee argues (pp. 97-99) that the trial court erred in finding (R. 3991) that slack-action casualties are of infrequent occurrence, and (R. 3993) a minor factor in determining whether the law is reasonable. During the 18 years 1923-1940, inclusive, there were 103 of these casualties in Arizona and 118 in Nevada (Exhibits 274, 275, 280, R. 3351, 3364, 3375). Of these, 101 occurred on short trains in Arizona, and 24 on short trains in Nevada; so that combining the two states there were 125 short train slack-action casualties. There were 96 of these casualties on long trains; 2 in Arizona and 94 in Nevada. During the last 12 years of this period, when long-train operation predominated in Nevada, there were 61 such casualties in that state and 62 in Arizona; an average of about five per year in each state. The "frequency" in Nevada was 3.77 per hundred million car-miles, or about one such casualty for every 26,525,000 car-miles operated. This rate is slightly less than the corresponding frequency rate in Arizona for the same period: 4.01 per hundred million car-miles, or about one for each 25,000,000 operated. Either "frequency" is so low as to warrant completely the observation that these casualties are indeed *infrequent*.

It is also clear that observance of the law in Arizona has not prevented or even reduced the frequency of these casualties, while unrestricted operation in Nevada, under

similar conditions, has not increased their frequency. In fact, the Nevada improvement over the 18-year period (57.5%, in the car-mile rates) is greater than in Arizona (47.7%); and this improvement comparison is particularly pertinent because in the earlier years, 1923-1926, short-train operation predominated in Nevada, whereas since 1929 long-train operation has greatly predominated.

Appellee attempts to build up the relative importance of these casualties by asserting (its brief, pp. 97-98) that casualties to employees occurring on passenger trains, in yard operations, on standing freight trains, or in other circumstances where train length has (according to appellee) no influence, should be excluded; that only those accidents and casualties which occur on trains while in motion should be taken into account. The influence of the law in causing additional trains to be run, and thus creating additional exposure to hazard, is not confined to those accidents occurring on moving trains. Accidents while trains are standing, or which result from pinched fingers, sand in eyes, and the like, are definitely related to the number of men exposed and thus to the number of trains run. Accidents to employees in yards or on passenger trains are likewise due to exposure, which again is directly proportionate to the number of men employed and thus to the number of trains run. Moreover, an increase in the number of freight trains operated increases the hazard to passenger trains arising from train interferences or collisions. Thus, it is entirely proper to relate the slack-action accidents, not merely to those occurring on freight-trains while in motion, but to all of the various accidents to which employees are exposed and to which *more* em-

ployees must be exposed if the law is obeyed. While it is true that slack action can occur only when the train is in motion, it is not true that accidents on moving trains are the only ones whose frequency is influenced by the law.

(b) Train Length Is Not the Sole or Controlling Factor in Slack-Action Accidents (Appellee's Brief, pp. 99-102).

At pages 99-100, appellee repeats its argument that the difficulty of controlling the slack and the severity of the slack-action shock increases as the train length increases; thus again disregarding all the other factors which influence the degree of control and determine the severity of the shock when slack action takes place. It is particularly *not* true that the *difficulty* of train handling and train control, with special reference to slack action, increases with train length. While greater *care* is required with larger and heavier trains, complete control can be and is obtained when ordinary care is used (R. 2435-2436, 2490, 2502, 2787, 2801, 2817).

Appellee argues, however, that in Nevada of the 48 slack-action accidents occurring during the 12-year period 1929-1940, all but one were on long trains and that exception was on a 69-car train; while in Arizona during the same period, out of 55 slack-action accidents, 42 were on trains of 65 or more cars (one on a long train) and only 13 on trains of less than 65 cars. Appellee thus confesses the complete unreasonableness of the law. By selecting 70 cars as the supposed safe operating maximum, the law has committed appellee to that figure. The supposed safe limit is not 65 or 60 cars, or something less; and to argue

that a train of that length is safe, but a 70-car train is not (the practical and logical deduction from appellee's discussion), is to admit that the law has no merit, even with relation to its supposed purpose of preventing slack-action casualties.

There is a complete explanation for the fact that these accidents occurred principally on trains of more than 65 cars. Since 1929 long-train operation has prevailed in Nevada; which means that comparatively few short trains have been operated, and those largely on branch lines or for short distances on main lines. In Arizona during the same period, while the law was generally observed, appellant endeavored to operate as near that limit as possible, and most of its through trains came within the 61-70-car bracket. Exhibit 214 (R. 3198) shows that in June and August, 1938 (the two typical months analyzed in the redispatching study) 85% of the trains actually operated were within the 61-70-car bracket, and only about 2% had less than 51 cars. Thus as in Nevada there was less opportunity for accidents on short trains, because being used largely for local or branch line service, or short main line runs, there was much less exposure.

The argument is presented (appellee's brief, pp. 100-102) and apparently greatly relied upon, that the severity of the injuries sustained in slack-action accidents is directly related to train length. To support this argument appellee presents a purported analysis of the slack-action casualties occurring in both Arizona and Nevada during the 12 years 1929-1940, contrasting a computed "average disability" in days from such casualties on long trains with a corresponding average for the casualties on short trains.

This comparison is misleading because it fails to take into account, *first*, various other controlling factors already mentioned, beside train length, which determine the extent and severity of the slack-action shock (and thus, to some degree, of the injury sustained); *second*, the variations in the individuals concerned, which play their part in determining the length of the disability of each; and *third*, the impossibility of deriving any true "rule of relative severity" from the comparatively small number of casualties reviewed.

This is particularly illustrated by the variation in the length of disability when two or more men are injured in the same accident, or when the same man is injured in different accidents. For example, in the accident shown in line 255, sheet 6, Exhibit 274 (R. 3356), a conductor and a brakeman were both injured because of a sudden stop of a 65-car train at Harqua, Arizona. The conductor's disability was only ten days, but the brakeman's was 74. Again, in the accident shown in line 352, sheet 8, of the same exhibit (R. 3358), due to the sudden stop of a 67-car train at Wymola, Arizona, three men were injured, the conductor suffering 41 days' disability, while the two brakemen were off duty, one for six and the other for five days. In the accident shown in line 287, sheet 7, Exhibit 274 (R. 3357), a brakeman on a 68-car train suffered a permanent disability, while in the accident shown in line 289 of the same exhibit, occurring less than three weeks later on a 70-car train, the brakeman suffered only eight days' disability. The two accidents were apparently quite similar. In the accident shown in line 210, sheet 5, Exhibit 275 (R. 3368), at Moor, Nevada, on a 100-car

train, the conductor suffered 306 days of disability while the brakeman was disabled for only 32 days. The same two men were injured in the accident shown in line 224, sheet 6, of the same exhibit (R. 3369), occurring at Avenel, Nevada, on a train of 111 cars; but upon this occasion the conductor was disabled for 20 days and the brakeman for 26. In the accident occurring at Hazen, Nevada, on March 1, 1935 (line 235, sheet 6, Exhibit 275, R. 3369) two men were injured by the sudden stop of an 82-car train, one suffering 44 days' and the other 7 days' disability; and in an exactly similar accident taking place a few months later at Carlin, Nevada (line 237 on the same page), a brakeman on a train of 131 cars suffered only 12 days' disability.

Appellee makes much of the accident occurring on November 19, 1938, at Reno, Nevada, in which five men were injured on an 85-car train, suffering disabilities ranging from 51 days up to 286 days; but the impossibility of deriving any rule from train length is illustrated by the exactly similar accident occurring at Reno on October 4, 1936 (line 245, sheet 7, Exhibit 275, R. 3369A), when the conductor on an 85-car train suffered a disability of only ten days.

The facts, as properly found by the trial court (R. 3973) are:

"It is not true, as apparently contended by plaintiff, that the amount and severity of slack-action occurring in a freight train depends solely upon the number of cars in a train * * *.

"It is likewise not true that the Train-Limit Law, by restricting the lengths of freight trains, either

eliminates or substantially reduces the number or severity of the casualties attributable to slack-action shocks in cabooses or other cars at or near the rear end of trains. The evidence indicates that in the operation of long trains, there have been many instances of severe jerks and jolts occurring at the rear end of the train because of slack-action, and that injuries have been suffered by brakemen and conductors as a result thereof. The record contains many similar instances occurring in connection with the operation of short trains. It is also shown that emergency stops of long trains have taken place, without causing any severe slack-action shocks to the caboose or injuries to the occupants thereof. Emergency stops of short trains have occurred, accompanied by severe slack-action shocks to the caboose and injury to the occupants thereof. The evidence shows that these different results, as herein indicated, on long and short trains arise because of the presence or absence, in the particular operation of the factors directly contributing to and controlling the severity of the slack-action."

The averages shown by appellee (its brief, pp. 101-102) are misleading in a statistical sense. In obtaining the figures for the averages of the long-train disabilities, appellee has included disabilities ranging from four days (the minimum reportable) up to a maximum of 663. Similarly, in obtaining the short-train average the minimum is four days and the maximum 180. While it is possible to compute a mathematical average of figures so widely apart as these, the result does not present an accurate picture. For example, one might compute an average of the height of the buildings in a particular block in which one was 40

stories high and all the rest three, but that average would hardly present an accurate picture of the block. The mere average of the wealth of 15 men, one of whom has a million dollars and the other fourteen five thousand apiece, does not present a true story of their composite prosperity. An average, to be fully representative, must be predicated upon individual figures which are not extremely far from the mean.

There is still another and more serious defect in appellee's computation. It has included in the long-train accidents a number which in reality are not of that character because of the circumstances of their occurrence. Thus, for example, it has included the accident at Moor, Nevada, shown in line 233, sheet 6, Exhibit 275 (R. 3369) in which a conductor suffered disability of 663 days because of an undesired emergency due to the failure of the train line in the 66th car from the head end of the train. While this was a train of 100 cars, the effect was the same as if the failure had taken place on the 36th car of a 70-car train; for there were but 34 cars between the point of the failure and the caboose in which the conductor was injured. In the *Nevada Train Limit Case* (*Southern Pacific Company v. Mashburn*, 18 Fed. Supp. 393), the court found,¹ with respect to those slack-action accidents caused by a break-in-two or other failure in the middle of the train, that:

"The number of cars between the caboose and the point where the train separates and not the total number of cars in the train is the factor to be considered

¹The findings of the Court in the *Nevada Case* are reproduced in the record of the hearing before the House Committee on Interstate and Foreign Commerce, 75th Congress, Third Session, on S-69, at pages 475-521. The quotation is from page 511.

together with other slack-action producing factors in determining the severity of the slack-action shock, if any, to the rear end or at any point behind the break. The number of cars ahead of the break has nothing to do with the shock experienced at the caboose or at any point behind the break.

"Casualties which the evidence shows were due to slack action from this cause would not be related to the number of car units operating in the train on which the accident occurred."

In other words, this accident is to be classed as a short-train accident, for the effect was the same as if there had been an emergency stop of a 34-car train. The accident on August 29, 1932, at Moor, Nevada (line 210, sheet 5, Exhibit 275, R. 3368), also included by appellee, in which the conductor suffered 306 days' disability and the brakeman 32 days, is of the same character, having been caused by a burst air hose on the 31st car of a 100-car train; so that there could not have been a "run-in" of slack of more than 69 cars between the point of the break and the caboose. If only these *two* accidents (and there are at least *four* others of the same kind) are transferred to the "short-train" side of appellee's comparison, where they properly belong, the average disability from short-train accidents becomes 38 days, and from long-train accidents 34 days; and it again appears, as the trial court properly found (R. 3973-3991), that the law does not, by restricting the length of freight trains, either eliminate or substantially reduce the number *or severity* of the casualties attributable to slack-action shocks in cabooses or other cars at or near the rear end of trains, and is not reason-

ably effective in the prevention or minimization of slack-action accidents and incident casualties.

- (c) **There Is No Actual and Substantial Hazard to the Public From Slack Action on Freight Trains on Appellant's Lines in Arizona** (Appellee's Brief, pp. 102-105).

At pages 102-105 of its brief appellee argues that there is a danger to the public from slack action, asserted to have a direct relation to the number of cars in a train. The alleged danger is that arising from the buckling of cars in freight trains when moving in multiple-track territory, or in yards where passenger trains are passed; and appellee again stresses the accident occurring on the Pennsylvania Railroad near Manor, Pa., on March 27, 1936 (Item 45, Exhibit 270, R. 3329).

If there is any such hazard—and even nationally, it appears to be very slight, appellee having been able to cite only three such accidents during the entire period covered by the record (1923-1939), in only one of which slack action appears to have been a factor—clearly the Arizona law is not directed towards its elimination, at least so far as appellant's lines are concerned. Upon the more than 808 miles of appellant's main line in Arizona, there are but 29.5 miles of "adjacent" double track, the balance of the double track being non-adjacent. There is no record of any accident or hazard of accident from this cause in Arizona, either disclosed by the exhibits or otherwise referred to in the testimony.

Moreover, the hazard of collision on double track because of wreckage from an adjoining track being struck is not peculiar to long-train operation. Exhibit 312 (R. 2265-

2267) contains reports of the Safety Bureau of the Interstate Commerce Commission covering five such accidents, all involving short trains, in which wreckage from one track fouled an adjacent track and was there struck by another train.

From this standpoint the law clearly has no rational safety basis, particularly as applied to appellant's Arizona operations.

- (d) **The Law Increases Rather Than Reduces the Hazards Due to Defects in or Failures of Freight-Car Equipment (Appellee's Brief, pp. 106-108).**

At pages 106-108 appellee argues that the law reduces the hazards incident to failure of freight car equipment, because it reduces the "strains on the weak parts," said to increase in quantity and quality as cars are added. This argument is based wholly upon theory and not on fact; for appellee errs in stating that there is no evidence from which a comparison of accidents on short and long trains from defects or failures of equipment, per train operated, can be made. Appellee has overlooked Exhibits 286, 287, 288, 389, and 397 (R. 3383-3385, 3565, 3578), which compare the derailments due to defects in or failures of freight car equipment, including particularly those due to weaknesses in the draft gears, draw bars and other portions subjected to strain, as they have occurred in Nevada, Arizona and New Mexico, and demonstrate that appellee's argument has no foundation. If appellee were correct, these derailments and the resulting casualties should have been much more frequent in Nevada, and somewhat more frequent in New Mexico, than in Arizona.

simply because of the long-train operation in the first two states. The fact is that in Nevada, in 18 years, there were 70 such derailments whereas there were 106 in Arizona, the rates per million train miles (i.e., on a "train-operated" basis) having been 2.02 for Nevada and 2.51 for Arizona, and per hundred-million car miles, 2.93 for Nevada and 4.64 for Arizona. Moreover, of the 70 Nevada derailments only 35 were on long trains. Thus out of the total of 176 derailments in both states, 141 (106 in Arizona, 35 in Nevada) were on short trains.

In New Mexico, during the 11-year period 1930-1940, there were 29 derailments of this type, 23 on short trains. During the same period there were in Arizona 42 such derailments, all on short trains; in Nevada 31, of which 11 were on short trains. It will be recalled that from 1926 on there has been a substantial long-train operation in Nevada, and since 1929 long-train operation has predominated.

Bearing in mind that the *same* types of equipment are operated in all three states, under the *same* operating rules and under operating conditions which, except for the law, are at least as favorable in Arizona, it is obvious that the law does not reduce any hazard associated with the alleged strain upon weak parts of freight car equipment, but on the contrary greatly increases the opportunity for this as for most, if not all, other types of accidents. The reason is that the law, by arbitrarily increasing the number of trains, greatly increases the amount of switching involved in making up and breaking up trains, and the number of starts and stops involved in running between terminals, because of the disproportionate increase in the

meets and passes required. Weaknesses leading to failures are largely developed in switching, starting, and stopping; and the results are evident in the larger number of derailments due to these failures in Arizona.

- (e) **The Alleged Difficulty of Seeing or Understanding Signals on Long Trains Does Not Result in Any Measurable Hazard** (Appellee's Brief, pp. 108-109).

At pages 108-109 of its brief appellee asserts that as the length of the train increases it becomes more difficult for the employees on the train to communicate with each other by signals, and infers that this gives rise to additional hazard. This contention, like many others made by appellee, is completely disposed of by an express finding of the trial court (Finding XIII(b), R. 4023-4025). The testimony of appellee's own witnesses shows that when a train is in motion there is only one signal that need be given, and that is the stop signal. If for any reason that signal is not seen by the engineer the conductor's valve in the caboose may be used to stop the train. This valve applies the brakes throughout the train, but they apply first in the caboose and then in succession forward to the engine. There can be no severe slack-action shock in the caboose in these circumstances. There is no evidence that any reportable long-train casualty has occurred in Nevada, or Arizona, or New Mexico, or on the Los Angeles Division in California, during the period covered by the testimony, due to the use of the conductor's valve; nor has any reportable casualty occurred in any of this territory while the train was in motion, asserted to have been due to failure to observe or interpret signals properly, where the

train length was claimed to have had any effect. There was one accident, without casualties, occurring from failure to see or understand a signal; but it involved the movement of a helper engine, with two cars and a caboose, the remainder of the train being at a standstill at the time. A supposed hazard which has not resulted in any casualty over a long period of years and extensive operation can hardly be said to have real existence.

Obviously there is no hazard from inability to see or understand signals while the train is standing; if signals are given and not understood, they can be repeated, or one of the men at the caboose can go forward until the signal can be seen.

Experience thus shows that the law is wholly unnecessary as a safeguard against the alleged hazards created by the supposed difficulty of seeing or interpreting signals on long trains.

(f) **The Alleged Hazard From Failure to Detect Defects on Cars of Long Trains Is Likewise Unsubstantial** (Appellee's Brief, pp. 109-111).

At pages 109-111 appellee argues that long-train operation is more hazardous, because of the supposed inability of members of the train crew to observe and detect defects in the cars of the train while in motion, and thus to prevent derailments or other accidents.

This contention is likewise covered by an express finding (Finding XIII(d), R. 4026-4029). The argument has no foundation, so far as concerns operations in Arizona and the adjacent territory, especially when Arizona operations are contrasted with those in neighboring states. If appellee's argument were sound, and there really were

greater difficulties in making inspection and observation upon long trains, there would follow a much greater frequency of derailments due to defects in or failures of freight car equipment, in long-train as compared to short-train operations; for the inspections at stops and the observance of the trains while in motion are for the primary purpose of detecting these failures before the accident occurs. However, these accidents have been more frequent in the short-train operation in Arizona than in the partial long-train operation in New Mexico, and much more frequent than in the long-train operation in Nevada. In both actual number and car-mile frequency, there were about 50% more derailments due to these causes in Arizona than in Nevada during the six years ending in 1940, and the Arizona rates were much higher throughout the 18 years 1923-1940 (Exhibit 288, R. 3385). The survey of long- and short-train operations between Lordsburg and El Paso (i.e., in New Mexico) during the first six months of 1940 (Exhibit 397, R. 3578) shows that in that territory inspection was just as effective on long as on short trains. The fact that derailments have occurred in Arizona, in greater number and with greater frequency on short trains, than in long-train operation in Nevada and New Mexico, indicates that there is no greater difficulty of effective observation on long trains, and that the alleged increased hazard of which appellee speaks is purely imaginary. No long-train accident of this kind was referred to by any witness, as to which a claim was or could have been made by the witness that it would have been prevented or lessened by inspection or observation if the train had been short.

(g) The Alleged "Fear of Long Trains" Is Unfounded (Appellee's Brief, p. 111).

At page 111, appellee argues that fear of injury is increased with increases in train lengths, thus reducing the efficiency of trainmen. This argument, like the preceding, is also covered by an express finding (Finding XIII(c), R. 4025-4026).

Since the evidence shows that the law does not eliminate accidents of any kind, least of all slack-action accidents, it is hard to see how the operation of short trains exclusively could eliminate any fear in the minds of the trainmen riding in the cabooses of such trains. If such fear results in inefficiency, it is apparently greater in short-train than in long-train territory; for there were 106 derailments due to defects in or failure of freight car equipment in Arizona, in 18 years, all on short trains, as compared to 70 in Nevada during the same years, only 35 of which were on long trains. Since it may fairly be argued that many of these derailments might have been prevented if the trainmen had detected the defects or failures in time, the greater number in Arizona can be properly ascribed to inefficiency of the crews, because all other conditions were either substantially the same or more favorable in Arizona.

The trial court found (R. 4206) that this alleged fear of long trains is unsubstantial and without foundation. Appellee's witnesses who testified along these lines were conductors who by preference work between El Paso and Lordsburg, where long-train operations are frequent, although they have seniority to hold equivalent positions in short-train territory west of Lordsburg. If fear of long

trains were of real consequence, it would be difficult to understand their long years of continuance in long-train territory.

Appellee's argument is based principally upon its analysis of the Arizona and Nevada slack-action casualties and resulting disabilities, already discussed. It is difficult to believe that a type of casualty which occurs as infrequently as do those from slack action in Nevada (in the six years 1935-1940, on the average slightly more than four times per year: once for every 31,850,000 car miles operated) produces any real apprehension leading to inefficiency, especially since the employees know that "train limitation does not remove this class of accidents, but instead increases the frequency and severity of all other hazards and casualties.

(h) By Increasing the Number of Trains and the Number of Employees Required, the Law Increases the Hazard of Accidents Due to Employee Negligence (Appellee's Brief, pp. 112-114).

Appellee next addresses its argument to the proposition that "long trains will not reduce the casualties due to negligence of employees." The topic suggested by this contention is likewise covered by a specific finding of the trial court (Finding XII(v), R. 4021-4022), stating that the operation of additional and unnecessary trains to handle the same volume of traffic which might be handled in longer and fewer trains, because it requires more employees and also more train orders and messages, increases the hazard of accidents resulting from misunderstanding or forgetfulness, or other kinds of negligence of employees.

It is obvious from ordinary experience that if more operations are required, and more men are employed to perform them, there are more opportunities for individual negligence or forgetfulness, and thus more accidents due to such negligence.

Appellee attempts, however, to support its argument by comparing the number of accidents on all Class I railroads caused by negligence of employees, which were investigated by the Bureau of Safety, with average train lengths during the same series of years, and then by a series of single-year comparisons attempts to show that in years when train lengths were greater there were also more of these accidents. The comparison is incomplete and meaningless; but even taken at face value it leads to no such deduction as appellee attempts. For example, in 1928, when the average train length was 48.1 cars, there were 23 such accidents investigated; but in 1932, when train lengths had declined to 44.8 cars, there were 24. In 1930, when the average train length was 48.9, there were 34 such accidents, but in 1939, when the average train length was 49.1 cars, there were 33. In 1932, when the average train length was the shortest (44.8 cars) of any of the years shown, the number of such accidents was 24, but with an increase in average train length to 46.2 cars in 1934, the number of accidents decreased to 23. There was also an increase in train length between 1936 and 1938 (46.4 to 47.7), and again the number of such accidents went down (32 to 28).

At pages 113 and 114 of its brief, as part of this argument appellee asserts that since the average train lengths for Class I railroads were 20 to 25 cars less than the 70

permitted by the law, there must have been at least ten short trains run for every long train. This is pure assumption, and in any event immaterial. The exposure of men and trains to accident and casualty does not depend upon mere numbers of trains operated, but upon the number of train miles made by those trains. Short trains may be relatively much more numerous, but if each runs only a few miles, it produces a comparatively slight exposure. Long trains are, however, seldom used in local or turn-around service or on branch lines, or for similar short runs. They are principally used in the longer through runs from terminal to terminal. Consequently the proportion of the train miles made by long trains, and thus of exposure incident to their operation, is much greater than the one-to-ten relationship assumed by appellee. While the record does not indicate what that relationship may be, it was testified on behalf of the railroads, in the proceedings before the House Committee on Interstate Commerce, 75th Congress, in connection with S. 69, that about 43% of the total freight car miles operated in 1936 were in trains of more than 70 cars (p. 851 of the Report of the Committee Hearings). Since long trains were only 18% of the trains involved in the 349 accidents to freight trains caused by negligence of employees, investigated by the Bureau of Safety during the period 1928-1939, it would appear that from this standpoint as well as all others, long-train operation is relatively safer.

- (i) **The Law Greatly Increases the Hazard of Grade-Crossing Accidents (Appellee's Brief, pp. 114-118).**

At pages 114-118 of its brief, appellee argues at length that the law does not increase, but on the contrary reduces

the hazard of grade crossing accidents, asserting that the evidence supports this contention.

Appellee's initial argument is that train lengths have little effect upon the opportunity for accidents, because, so it says, with a larger number of shorter trains the addition of the engines and cabooses will cause only a slight increase in the total length of time that the grade crossings are occupied, which will be offset by the faster speed of the short trains. Like much of appellee's other argument, this is pure theory which has no factual foundation. There are, as appellee says, two principal types of grade crossing accidents: those in which the engine strikes the automobile or other vehicle, and those in which the vehicle strikes the side of the train. The latter type constituted about 34.6% of the total grade crossing accidents occurring during the years 1935-1939. Whichever type be considered, however, the danger is bound to be greater if more trains are operated. Assuming the volume of the automobile traffic over a particular crossing to be constant, the hazard of automobiles being struck by trains, or of automobiles striking trains on that crossing increases directly with the number of trains operated over it. This is the essential conclusion to be drawn from the fact that, in the United States at large, the frequency of grade-crossing casualties is almost the same year after year, as measured against train miles operated. An increase in the number of trains, and thus in the number of train miles, produces a proportionate increase in the number of casualties at the rate of about 6.45 per million train miles. The experience has been too consistent and too complete to permit any other conclusion.

The Interstate Commerce Commission recognizes that the volume of rail traffic, measured in train miles, is one of the essential bases to be employed in calculating the frequency of grade-crossing accidents (R. 1966, 2168), having said that it is necessary to know the volume of the rail, as well as the highway, traffic passing over grade crossings. Naturally, if the highway traffic increases in volume the likelihood of accidents at that crossing increases; but if the automobile traffic remains constant, and the number of trains over the crossing increases, the likelihood of accident likewise increases.

It is particularly pertinent to note that while the rate per million train miles of grade crossing casualties throughout the years since 1923 has remained practically constant, average train lengths have increased substantially, as also the number of long trains operated. This shows that the grade crossing casualty rates are independent of train length. While the rate does not rise with an increase in trains operated, the aggregate number of casualties increases in direct proportion. Arizona, by compelling an artificial increase of about 28% in the total number of trains operated, has created the opportunity for and the probability of a 28% increase in the number of grade crossing casualties, even though the rate per train mile is not affected.

Appellee places great emphasis upon the exhibits (Nos. 293, R. 3422; 334, R. 3461; and 335, R. 3462) showing the grade crossing casualties per 10,000 automobiles registered, in Arizona, Nevada, and New Mexico. These exhibits obviously have no relation to the question of the effect of the law upon this type of accident. The law

neither increases nor reduces the number of automobiles registered, and so does not affect the number of automobiles using grade crossings in Arizona. But, as appellee recognizes, the use of the grade crossings *by automobiles* is only one of the two factors which cooperate to produce grade-crossing accidents. The law does directly affect the other factor—the frequency of use of those crossings *by trains*—and by artificially increasing the number of trains, increases the hazard in direct ratio.

Appellee's argument (its brief, p. 118) that the more frequent operation of trains over grade crossings is beneficial because of producing "a greater awareness" of danger on the part of automobile drivers hardly merits reply: the sum total of ordinary experience points to an exactly opposite conclusion. It is common knowledge that wig-wags, flashing signals, and other devices designed to warn the motorist of the presence of railroad grade crossings are placed, *not* at crossings where train movements are relatively infrequent, but upon those where such movements are most frequent and the dangers therefore acknowledged to be greatest. At the little used crossing the ordinary fixed wooden crossing sign is usually deemed sufficient. The number of trains or of movements over the crossing is invariably the factor which determines the degree of warning protection to be provided; and the number of trains is the controllable factor of crossing hazard which the law unnecessarily and avoidably increases.

5. APPELLANT'S SAFETY EVIDENCE

(Appellee's Brief, pp. 121-143)

(a) "The National Evidence" (Appellee's Brief, pp. 121-135).

Under the above sub-title appellee argues that our showing, based upon accidents and casualties of railroads of the United States generally, has no evidentiary value and fails to support any findings or conclusions with respect to safety of train operations insofar as any issue in this case is concerned. Appellee includes in this argument certain criticisms also of the Arizona-Nevada comparisons (see, for example, pp. 126, 131-135), although these are also made the subject of additional comment (at pp. 135-138) under a separate subheading.

Appellee first asserts (p. 122) that the conceded "very substantial decrease" in accident and casualty rates over the period 1923-1939 is not in any way due or related to the length of trains operated; by which it presumably means to contend that there is nothing to show that this improvement was due to the adoption and development of the long-train operating practice and the resulting widespread operation of long trains. It is certainly the fact, which appellee cannot challenge, that during this period there was a substantial increase in average train lengths and a continued expansion of the long-train operating practice, except in Arizona; and that in Arizona the improvement in casualty frequency was considerably less than the national improvement, no matter what basis of measurement be taken. All of the other factors mentioned by appellee, to which it attributes the improvement in casualties, had full opportunity to operate in Arizona; that is to say, the improvements in equipment (e.g., the

elimination of weak graduating springs in air brake triple valves, and of arch-bar trucks), road bed, block signals, and operating methods; the grade-crossing eliminations, etc. The record shows, and appellee accepted largely without challenge the finding, that these same improvements all occurred in Arizona (Finding VI, R. 3902-3908). The only fair conclusion is that the compelled short-train operation, the only differentiating factor, has prevented the safety improvements achieved elsewhere. This is confirmed by the results in Nevada, where conditions are practically identical with those in Arizona, except for the more severe winters, and the improvement in casualty frequency is substantially as great as nationally, and much greater than in Arizona.

Appellee argues, however, that the exhibits presenting the national showing (Nos. 262-271, R. 3300-3366) are of no value because they include the combined operations of both long and short trains, there being no separation between purely long-train and purely short-train operations. This is appellee's stock argument, by which it undertakes to shape and restate the issues to suit its own purposes, and has already been discussed in both our opening brief (Vol. I, p. 203), and this reply (ante, p. 62).

The merits of the law as a safety measure can be measured properly only by contrasting the complete operation which it compels with the complete operation which would be conducted if it were not in effect: i.e., by comparing the Arizona short-train operation with a standard long-train operation which includes the use of trains of all lengths, in accordance with the traffic demands and as may

be consistent with speed, economy, and safety. No purpose is served by comparing the operation of one or a number of long trains, with an equal number of short trains, because that comparison would not reflect an actual condition, or contrast equivalent performances or exposures.

At page 123 of its brief appellee undertakes to summarize appellant's argument based upon the casualty comparisons. All of the factors contributing to greater safety of railroad operation have been available in Arizona, to the same extent as in other states and upon other railroads; but the reduction in the number and frequency of accidents and casualties in Arizona has been much less than elsewhere. The only real differentiating factor is the Arizona law, which has not permitted the development of the safer long-train operating practice. Our contention is, therefore, not only that the operation of long trains outside of Arizona, in conjunction with all of the other improvements in equipment and methods, has caused the improvement in casualty frequencies; but also, as appellee fails to note; that the continuance of the Arizona restriction has prevented a similar improvement in Arizona, in spite of the use there of the same improved equipment and the presence of other favorable conditions.

Appellee asserts (its brief, pp. 123-128) that the exhibits showing the national casualty results are not properly comparable to those covering Arizona, and draws attention particularly to Exhibits 262 and 276 (R. 3300, 3371). In the tabulation at pages 191 and 192 of Volume II of our opening brief, we contrasted the national improvement with the Nevada and Arizona improvements in casualty rates to various classes of employees and from

various classes of accidents; and in using these two exhibits, which present the number and rates of casualties to all classes of employees on duty in all classes of service, we used the improvements in the rate per million locomotive miles for Nevada and Arizona, contrasting them with the improvements in the car-mile and train-mile casualty rates nationally. The casualty rate per million locomotive miles is also available nationally. On this basis the casualty rate to all classes of employees on duty in the five years 1935-1939, was 66.74% less than in 1923-1928. The corresponding improvement on the train-mile basis was 66.99%. These improvements compare with the Arizona improvement, contrasting the six years 1935-1940 with the six years 1923-1928, of 38.7%. These exhibits also show that the use of the locomotive-mile basis presents no substantial variation in trend from the train-mile basis. Appellee's objection is obviously untenable.

Appellee also argues (its brief, pp. 124-127) that the Arizona figures are meaningless because the first period, 1923-1928, includes the years 1923 and 1924, and that the El Paso and Southwestern and Arizona Eastern lines were acquired on November 1, 1924, resulting in an increase in the Arizona operated mileage. It then says that if the casualty rates were substantially higher on the acquired territory than on the original territory, the rates on the combined operation would be higher than on the original operation. Mere acquisition of mileage will not change casualty rates calculated upon the basis of traffic moved (car miles), or train units employed (train miles); nor will it produce any substantial disturbance unless the acquired mileage is quite different in its characteristics

from the mileage owned prior to the acquisition. There was no substantial change in casualty rates as a result of the acquisition, as may be seen by comparing the Arizona rates for the year 1923 with those for 1925, the first full year following the acquisition. The 1925 rates were somewhat higher than for 1924, but slightly lower than for 1923 (Exhibits 276-280, R. 3371-3375); and after 1925 there was generally a moderate downward trend. Thus it is apparent that the acquisition had no disturbing effect. This result is quite natural, for these lines were in the same general territory, encountering the same operating conditions, and subject to the same restrictions as the lines to which they were added.

At pages 127 and 128 of its brief appellee argues, as a further reason for disregarding the national comparisons, that work-train miles are included in the basis against which the rates are computed upon the national exhibits, but not upon the Arizona and Nevada showings. This criticism is wholly beside the point, because all of these showings are for the purpose of determining the *trend*, by years and groups of years throughout the period studied; and since the same basis of total performance is used each year for the national showing, the trend is accurately indicated. The national accident totals include accidents and casualties on work trains, because the Interstate Commerce Commission statistics are prepared in that way. The train miles and car miles accumulated upon the work trains upon which these accidents took place are therefore properly used in calculating the frequency. Since work trains are always short trains, the showing properly reflects whatever increased safety may have been due to

that factor. In the Nevada-Arizona exhibits a segregation of the work-train accidents and work-train car miles and train miles was possible and was therefore made. Since, however, the essential purpose of the exhibits is to show trends, and the same basis is used throughout these exhibits, appellee's criticism is clearly without foundation. These statistics are of the same type and source which this Court has called "incontrovertible" (*Railroad Retirement Board v. Alton R. Co.*, 295 U.S. 330, 364).

At pages 128-131 of its brief appellee presents a list of the detail of the casualties to road freight conductors, brakemen and flagmen on duty, occurring during the year 1937 in Arizona and Nevada. It will be noted that this list is confined to accidents to this restricted class of individuals, and does not include accidents to other classes of employees on duty, occurring in road freight train operation, or any accidents occurring in any other classes of service. The showing, therefore, while correct so far as it goes, is incomplete as an attempted comparison between Arizona and Nevada from the standpoint of relative safety of railroad operations.

Following this listing appellee emphasizes that there were two accidents in Arizona due to sand or particles in the employees' eyes, compared to none in Nevada. This limited comparison does not establish, as appellee contends, that there is any peculiar local condition in Arizona, such as sand storms, not encountered in Nevada. It is noteworthy that there has been no casualty of this kind reported in Arizona since 1938. These casualties are very unimportant, and certainly do not indicate by their presence or absence any real difference in operating condi-

tions. They are significant only because, by their greater frequency in Arizona, they show the effect of the added exposure due to the unnecessary employment of men on account of the law.

Appellee also compares the casualties occurring in the operation of hand brakes, and asserts that this is due to a difference in operations in the two states. Appellee is mistaken in its statement of the purposes for which hand brakes are used; they are used not only to insure that a detached car remains in place after being spotted on a siding for loading or unloading, but also to control and stop cars in switching movements ("flying switches" or "drops"), or to "tie down" a train when stopped on the main line, if the engine is detached to do other work. The only difference in operating conditions which might lead to a greater use of hand brakes, and thus a greater number of hand brake accidents in Arizona, is directly attributable to the law. Because of its effects, trains must be remade, and more trains operated, so that there is more switching in making up and breaking up trains, and more use of the hand brakes. The difference in the volume of local traffic, to which appellee refers, has but little effect upon their use. It is so small in either state, by comparison with the total amount of the traffic, as to be relatively unimportant. It should also be noted that these hand-brake casualties occur either at low speeds or while trains are standing; and as the trial court found (R. 4009), nearly all of these standing accidents occur on short trains and are increased by the number of trains operated. So far as concerns the brake appliances and the cars themselves, and their use, these are the same in both

states, and there is no difference in the conditions under which they are used.

Appellee also refers (its brief, p. 133) to the casualties caused by stepping on or stumbling over rocks in the road bed, or by being thrown by jerk or jar in switching movements. These stumbling accidents occur mostly at meeting points, where brakemen must run ahead of or after their trains, in order to open or after closing switches. The greater number of trains operated in Arizona, in proportion to traffic handled, greatly increases the number of meets and passes, and thus the opportunity for these accidents. Thus the difference in operating conditions alleged by appellee is really due to the law itself.

Appellee refers (its brief, p. 133) to certain other classes of casualties asserted to have no relation to the length of the train. It appears to claim, in this connection, that there is some burden upon appellant to show that these accidents would have been prevented or minimized if long trains had been operated in place of short trains. These accidents are important in the consideration of the case because they are the result of the exposure of men to the hazards incident to railroad operation. While possibly not directly related to the length of the trains upon which they occur, they are related to the limitation because that factor compels more trains to be operated and thus more men to be exposed.

At best, appellee's argument only shows that the restriction has no effect at all to reduce or minimize these and the other classes of accidents and casualties. Even if this were true, appellee's cause would not be aided. A costly and obstructive restriction, which actually accom-

plishes no improvement in safety, is just as unreasonable as one which increases the hazards. However, as demonstrated by the entire showing, the law is not only of no positive benefit, but instead substantially *increases* hazards and resulting casualties.

At page 134 appellee asserts that in 1937 there were nine "slack-action" casualties (in seven accidents) in Arizona, and only four in Nevada; and that this sustains its contention that conditions (such as dips, hog-backs, grades, and curves) which produced slack-action are more prevalent in Arizona. Actually there were 11 casualties due to "sudden stops, etc.," in Arizona in 1937, appellee having omitted the casualties shown in lines 449 and 470 on sheet 11 of Exhibit 274 (R. 3361), although these are mentioned in the list at pages 129 and 130 of its brief. Consideration of the individual Arizona accidents shows that none of them was due to the effect of any of the conditions mentioned by appellee. The two accidents at Yuma occurred within yard limits, on level track, and were due to undesired emergency applications while the trains were either stopping or starting. The accident at Jaynes occurred just outside the Tucson yard limits, where the track is straight and grade about 0.8%. This accident was also due to an undesired emergency, thus resembling the Yuma accidents. A fourth accident occurred at Bowie when the train was making the station stop. A fifth took place at Picacho where the track is straight and practically level for many miles. A sixth accident occurred at Tucson, within yard limits, and was due to a break-in-two while the train was being backed at a speed of about eight miles per hour. At Tucson the grade is less than

one percent, and there is no curvature which would have affected the movement. A seventh occurred at Benson, when the train broke in two because of a defective drawbar. The two accidents omitted by appellee occurred, one at Calumet, near Douglas, and was caused by a sudden stop during a switching move; the other at Coolidge, when the caboose, previously detached from the train, made a hard coupling with standing cars, and the injured brakeman was thrown to the ground. This was also during a switching move. At this point the track is straight and level.

If the presence of hog-backs, dips, grades, etc., were frequently productive of this type of accident, one would expect that in the years preceding and following 1937 there would be similar accidents at the same points and with about the same frequency. Actually in 1936 there were only three "sudden-stop" accidents and casualties and in 1938 only two; and all of these, except one occurring in 1936, took place at points other than those where the eleven casualties occurred in 1937. That one exception was at Tucson (line 433, R. 3360) when the slack ran out as a westbound train arriving at Tucson was coming to a stop.

Appellee also presents at this point (its brief, p. 134) a comparison of disability resulting from the long and short train slack-action casualties in the two states in 1937, and attempts to derive from these thirteen casualties which it mentions a rule as to the relative severity of the shock and the resulting injury, with relation to train length. We have already commented upon this type of comparison. The number of casualties used as the basis is so limited as to be clearly inadequate to support ap-

appellee's theory. In fact, by the selection of casualties in other years an entirely different picture could be presented. In 1926 (Exhibit 274, pp. 3-4, R. 3353-3354), there were in Arizona 11 slack-action casualties, all on short trains, one of which was fatal, while in another the injured employee died. In 1927 there were five slack-action casualties and one of these was fatal (R. 3354-3355). In 1929 there were six such casualties (R. 3356-3357), one a permanent disability. Appellee's argument demonstrates nothing except its own care in making its selections.

The tabulation presented by appellee (its brief, p. 135) fails entirely to support its argument. It is merely a set of selected comparisons, which, so far as concerns average train lengths, are on the single-year basis, although where casualties are concerned groups of years have been taken. Appellee appears to recognize that there has been a general downward trend in the casualty rates, but attempts to show that it has no relation to the growth of long-train operation, because in some selected year a downward trend in average train length was nevertheless accompanied by a continuing decline in the casualty rates. It is quite true that by careful selection such variations in trends can be discovered; but the general downward trend over the 18 years covered by appellant's exhibits is not at all disturbed by these highly selective comparisons. That trend is particularly portrayed, for Arizona and Nevada, in the table printed at page 174 of Volume II of appellant's opening brief; and the percentage trends are shown at pages 191 and 192 of that brief, in a tabulation which covers Class I railroads as well.

It will be observed that in the tabulations at page 174 we have taken into account average train lengths over a group of years, corresponding to the groups of years for which casualty frequencies are shown. If appellee had followed this same method, it would have shown that while the rates of improvement vary, dependent upon the type of casualty studied and the periods selected, nevertheless casualty rates tend to improve materially with increases in train lengths, especially if such increases are substantial; while if train lengths are not increased the casualty improvement is less, and if train lengths decline the improvement comes to a standstill. Exhibit 264 (R. 3302) and 282 (R. 3377) furnish good examples of these results.

(b) The Arizona-Nevada Comparisons (Appellee's Brief, pp. 135-138).

At pages 135-138 of its brief appellee renews its criticism of the Arizona-Nevada casualty comparisons (Exhibits 274-294, R. 3310-3421; 389, R. 3565; 391, R. 3567; and 392, R. 3568). Nearly all of appellee's criticisms have already been discussed, such as the inclusion in the showing of the Arizona operations prior to the acquisition of the El Paso and Southwestern and Arizona Eastern, the supposedly heavier local traffic in Arizona, and the greater number of casualties in that state due to sand or particles in the eye.

At page 137 of its brief appellee presents another selective single-year comparison of average train lengths and slack-action casualty rates, the latter being on the train-mile basis. This tabulation is meaningless because, first

of all, it does not include all of the years, but only alternate years, and excludes entirely the years prior to 1926 which preceded the development of long-train operation, both nationally and in Nevada. Furthermore, as a single-year comparison it is obviously defective so far as concerns slack-action casualties, because of the infrequency of this type of casualties and the consequent disturbing effect of only one or two such casualties in a particular year. What appellee has done is to select the years which are most favorable to Arizona and omit the other years. For example, in 1931, which appellee omits from the table, there was only one slack-action casualty in Nevada but 10 in Arizona; in 1937, also omitted, there were four slack-action casualties in Nevada but 11 in Arizona. In 1923-1925, years of predominant *short-train* operation in Nevada, there were 34 slack-action casualties. There is no need, however, for the Court to be misled by the partial picture presented by appellee. The full showing with respect to slack action appears on Exhibit 266 (R. 3304), which presents the national picture for each of the 17 years 1923-1939, and by presenting both train-mile and car-mile totals affords a basis from which may be computed, year by year, the average length of all the trains operated in the services in which these casualties occurred; and for Arizona and Nevada on Exhibit 280 (R. 3375), which presents a corresponding showing, but includes also the year 1940.

Appellee renews its argument that the operating conditions, as shown by the profile maps covering the Arizona and Nevada lines, are substantially more severe in Arizona. At the risk of repetition we point out again that

the differences between the two states are very slight and in most respects actually favor the Arizona operations. The maximum ruling grades in the latter state are slightly less than in Nevada. While the maximum curvature on the Arizona main lines is 10° , there are comparatively few such curves, and these not only do not handicap the operation of long trains but actually assist. In general, the grade conditions in both states are very favorable because the lines lie for the most part in level, desert territory where there are no obstructions to efficient long-train operation. It would be difficult, and indeed appellee has not suggested that it is possible, to find two territories more nearly alike, for the purposes of this case, than appellant's Nevada and Arizona lines. Three trial courts have agreed that there is a close similarity (the federal courts for Arizona in the *First Arizona Train Limit Case*, 2 Fed. Supp. 855, and Nevada in the *Nevada Train Limit Case*, 18 Fed. Supp. 393; and the trial court in the present case). The trial court's findings (Findings III(c), R. 3896-3897; IV(c), R. 3900; and VII(a)(5), R. 3914-3915, in particular) fully cover this point: and since they apparently are not classed by appellee as "ultimate" findings, they are not, even in its view, disturbed by the decision of the state supreme court.

(c) Los Angeles Division Casualty Statistics (Appellee's Brief, pp. 138-140).

At pages 138-140 appellee comments upon the casualty statistics for appellant's Los Angeles Division. Its first objection is that it can find no testimony of record as to the percentage of long and short trains operated there.

The trial court's finding respecting the percentage of long trains on certain main lines of that Division during four typical months of 1939 is predicated upon Exhibits 154 (R. 3028) and 185 (R. 3077). The latter shows (lines 34-38) that on certain lines forming a part of the Los Angeles Division the indicated numbers of long and short trains were operated. By a simple mathematical computation the percentage of long trains to the total can be derived. Appellee simply failed to examine the record before it drafted its argument.

The objection is made that the train count is incorrect, because a train is classified as "long" if at any time during its operation it had more than 70 cars. In making the count reproduced on Exhibit 185, appellant used the test which the law itself provides.

While it is true that on the Los Angeles Division the casualty rates to employees, to occupants of motor vehicles, and to non-trespassers generally show some small increase in the five-year period 1936-1940, as compared to the six-year period 1930-1935, the variations are not so substantial as to warrant any particular conclusion. The total number of casualties in any one year, in any one classification, is so small that the occurrence of two or three more casualties per year in the earlier six-year period, or of two or three less in the later five-year period, would have altered the picture completely. Exhibit 386 does show, however, that the greatest hazard to the public from train operation is at grade crossings: of the total of 252 casualties to non-trespassers in the 11 years, 236 were to occupants of motor vehicles. The number of these casualties increased substantially with the increase in the

number of train miles operated in the later five-year period, 1936-1940; thus showing again that an increase in the number of trains operated will be accompanied by a substantial increase in the number of grade crossing accidents, even though other factors remained unchanged.

(d) **New Mexico Casualty Statistics** (Appellee's Brief, pp. 140-142).

At pages 140-142 appellee presents its criticisms of the Arizona-New Mexico casualty comparisons. This argument is somewhat peculiar, because appellee itself first undertook to make a showing for appellant's New Mexico lines (its Exhibits 338, 340, 349, 362, 364 and 368; R. 3465, 3501, 3518, 3527). Appellant simply met this testimony by taking the casualty showing *appearing upon appellee's exhibits*, and presenting it together with a showing for Nevada and Arizona, so as to give a complete picture for all three states for similar classes of accidents and casualties (appellant's Exhibits 387-389, R. 3548-3565). Appellee is therefore in no position to argue a lack of similarity as between New Mexico and Arizona. However, there is an adequate showing to support these comparisons. Exhibits 165 (R. 3039), 186 (R. 3042), and 218 (R. 3206) cover the traffic and operating conditions, in addition to which there is oral testimony showing that the same traffic, both eastward and westward, which moves across Arizona, also moves across New Mexico.

So far as concerns appellee's attempted analysis of Exhibit 387 (R. 3549-3557), it is sufficient to point out again, as with the corresponding exhibit covering the Los Angeles Division (No. 386, R. 3533), that the number of accidents or casualties in any year is so small as not to warrant any

dogmatic conclusion, in the light of the comparatively slight variations in train length shown for the state. The addition of two or three casualties in any one of the groups or years would have modified the showing materially, and permitted a deduction completely contrary to that now attempted by appellee.

The striking feature of appellee's argument is, however, that it seeks to emphaize, as usual, only the slack-action accidents, and in this instance only those occurring on trains of 65 cars or more. This argument again confesses the complete unreasonableness of the law, even as a slack-action prevention measure. The law has set 70 and not 65 cars as the presumed safe limit, and this argument demonstrates that that limit has no true relation to safety from even this particular type of accident.

(c) **Santa Fe and Chesapeake & Ohio Casualty Statistics (Appellee's Brief, pp. 142-143).**

At pages 142-143, appellee discusses the Santa Fe and Chesapeake and Ohio casualty showings covered by separate sub-paragraphs in the trial court's findings (paragraphs (k) and (l) of Finding XII, R. 4004-4008). The relevant facts are carefully set forth in the findings, but largely overlooked in appellee's discussion. Contrary to appellee's assertion, Exhibit 126 (R. 2986), which summarizes operating conditions on the Santa Fe main lines, shows that operating conditions in the territory between Needles, California and Gallup, New Mexico (where the Arizona restriction is completely effective), are generally as favorable as between Gallup and Clovis, New Mexico. Between Needles and Belen the operation is entirely double

track; whereas the operation is all single track between Belen, New Mexico and Clovis. Appellee has asserted (its brief, p. 138) that the double-track operation in Nevada makes for a more favorable condition in that state; and to whatever extent this is true, it is also true of the Santa Fe operation in Arizona and New Mexico west of Belen.

The traffic carried is predominantly through or overhead traffic, and in fact largely the same traffic, carried across New Mexico either before or after it crosses Arizona (R. 1856-1857, 1876, 1882). The comparison is between the Arizona operation under the 70-car restriction, and an operation in part affected by that restriction, although not entirely controlled (between Gallup and Belen), and in part a standard long-train operation (between Belen and Clovis). The number and frequency of the casualties to all-train service employees, and particularly trainmen (as a separate group from enginemen), are much less in the New Mexico districts than in Arizona, although because of the absence of the restriction the average train length is much greater.

There is no record foundation for appellee's assertion that any of these accidents were caused by the so-called "purely local conditions" to which it refers; nor is there, in particular, any possible or plausible foundation for its contention that the Arizona casualties from setting or releasing brakes, or picking up or setting out local traffic, are more numerous than in New Mexico. If, however, this is true, it is solely because the Arizona restriction compels more trains to be operated, and more men to be employed, and thus increases the exposure.

The Santa Fe Arizona-New Mexico casualty comparisons are convincing evidence that the 70-car restriction bears no relation to safety whatever, but on the contrary increases the hazards substantially.

Appellee attacks the Chesapeake & Ohio comparisons because, *first*, the traffic of this railroad consists largely of coal; *second*, it has accomplished a considerable amount of grade and curve elimination which, according to appellee, has greatly improved safety conditions; and *third*, the showing relates to all classes of service, both freight and passenger. The first objection is wholly without merit. Coal is a heavy-loading commodity, the gross weight of a car with its contents amounting to about 75 tons; so that a train of 160 cars, the normal operation on most districts of the Chesapeake & Ohio main line, has a total gross weight of about 12,000 tons (R. 881-884, 915). If there were any merit to appellee's contention that longer and heavier trains are more difficult to control, with consequent greater hazards, casualty results on the C&O would be more unfavorable than elsewhere, particularly in Arizona, where a maximum train of 70 cars of the usual weight handled does not exceed 4500 tons; and the average is much less. Thus the difference pointed out by appellee, if it means anything, indicates more arduous conditions on the C&O, in spite of which that carrier has achieved a remarkable safety record.

The evidence, while indicating that the Chesapeake & Ohio has made extensive improvements, does not show that these have been any greater in character or degree than upon appellant's lines in Arizona. Finding VI(a) (R. 3902-3904) describes the details of these improve-

ments, and in these respects has not been challenged by appellee.

Appellee's final criticism is completely untenable. There is both a national and an Arizona-Nevada showing of casualties to all classes of employees on duty in train and train-service accidents; the national showing (Exhibit 262, R. 3300) includes both the car-mile frequency (the basis employed in the C&O showing: Exhibit 122, R. 2982), and as well the train-mile and locomotive-mile rates. The Arizona-Nevada comparison (Exhibit 276, R. 3371) shows rates and improvement trends in casualties to all classes of employees, based upon locomotive-mile rates; and while the basis is slightly different, there is no lack of a proper comparison since the purpose of these exhibits is primarily to show *trends* in accident *frequencies* rather than merely total *numbers* of accidents or casualties, year by year. The trend of the accident rates on the Chesapeake & Ohio, whether all employees or only train and engine-service employees be considered, shows a substantial decline over the period studied (1924-1938), approximately the same as the national trend, and considerably more than in either Nevada or Arizona. It cannot be doubted that this favorable result is due in large part, if not entirely, to the adoption and use of the long-train practice by the Chesapeake & Ohio, which is, as stated, one of the outstanding "long-train" railroads of the country.

6. ALLEGED PASSENGER TRAIN HAZARDS

(Appellee's Brief, pp. 144-147)

In this portion of its discussion appellee again presents arguments for which virtually no evidence is cited, and

which are in fact not supported by the record. There is a complete showing of passenger train casualties to employees in Nevada and Arizona for the period 1923-1939 (Exhibits 291, 292; R. 3409-3421). Appellee's own Exhibits 362 and 368 (R. 3501-3506, 3527) purport to be a complete showing of passenger train accidents in New Mexico for the period 1930-1940; and its Exhibits 363 (R. 3507-3517) and 370 (R. 3529) purport to show similar casualties on the Los Angeles Division during the same period. There is no showing of any slack-action casualty in Nevada, Arizona, or New Mexico, occurring on a passenger train of more than 14 cars, or in fact any casualty of any kind involving a long train, as to which it could be reasonably argued that train length had anything to do with the accident. On the Los Angeles Division four casualties are shown, occurring on trains of 16 and 17 cars, in which the injured persons were claimed to have been thrown off balance by emergency stops; but these four are matched by many others, occurring upon trains of as few as nine cars, where exactly the same causes are assigned. None of these casualties involved any serious or lengthy disabilities.

Appellee refers to the greater weight of passenger cars, and the greater number of persons exposed to hazards of slack action on passenger trains. If the greater weight or the greater exposure resulted in any real and substantial hazard, it should be capable of expression in a casualty rate based upon passenger miles or train miles. Actually the hazard from this cause (slack action) is so slight that no such casualty rate was attempted to be computed by either appellee or appellant. The fact is that there is no

substantial hazard; nor is there any such hazard peculiar to long trains, which does not also exist upon trains much shorter than the Arizona maximum.

There is particularly no support for appellee's contention that passengers are subjected to hazards of slack action while walking through moving trains en route to diners or at stations where platforms are too short to accommodate a long train. Appellee fails to refer to any accident of this character occurring upon a passenger train where the train length had any influence, or contributed in any way.

There is likewise no record support for the contention that passengers on long trains must be detrained at places where the footing is unsafe, or that that condition would not equally exist with short trains. It is obvious that in southern Arizona snowfall, or snow on the ground, such as appellee mentions, are very unlikely ever to interfere with passengers detraining from or boarding appellant's passenger trains, whether or not long trains are operated. The suggestion that passengers walking through moving trains may be knocked down, because of slack action, more frequently on long than on short trains, is wholly imaginary.

The argument on page 146 of appellee's brief, relating to the results of increased weight of the train by reason of the addition of cars, is equally without support in the evidence. There is no showing that a train of more than 14 passenger cars cannot be stopped in emergency just as readily as a shorter train. The addition of cars to the train may add to its gross tonnage, but the braking power is also proportionately increased (R. 2475).

It is idle to argue that an increase in passenger-train length increases the probability of highway grade crossing accidents. The increase in number of passenger trains run by reason of the limitation actually multiplies the grade crossing hazard and the resulting casualties. In a grade crossing collision involving a passenger train the number of cars behind the locomotive obviously cuts no figure; the damage is done when the engine collides with the automobile, and the weight of the additional cars adds little to the destructive striking force of the engine itself.

The ultimate test of increased hazard in long passenger train operation is to be found in actual experience. The Arizona-Nevada comparisons (Exhibit 292 R. 3413) show clearly that appellee's argument has no basis. Even taking into account the many casualties involved in the malicious derailment of the Streamliner at Harney, Nevada, in August, 1939, the casualty rates in Arizona are nearly twice the Nevada rates, the same relationship prevailing whether the frequencies are computed on the basis of passengers carried, passenger miles made, or passenger train-miles operated.

The argument that employees have less time to look after the safety of passengers on long than on short trains, and that safety is therefore impaired, is likewise answered by the statistics showing actual results. Long passenger train operation is the customary and usual practice all over the United States except in Arizona; and insofar as concerns the ability of employees to attend to passengers and to their other duties, the conditions are no different than in Arizona. If safety were impaired

for this reason in long passenger train operation, the results would quickly appear in the casualty statistics.

Furthermore, the addition of cars to passenger trains does not always result in more passengers, as appellee asserts. In many cases express or baggage cars are added which, though increasing the train length, do not increase the number of passengers. Other types such as dining cars, lounge cars, club cars, and railroad business cars, when added to passenger trains, likewise do not add to the number of passengers carried. When sleeping cars are added, additional employees are also added (Pullman conductors and porters), whose duty it is to look after the care and comfort of the passengers.

Appellee's argument is thus unsound in both fact and theory.

7. "SUMMARY OF SAFETY ARGUMENT"

(Appellee's Brief, pp. 147-148)

Under the above heading appellee presents a summary of its safety argument which repeats in a few short paragraphs some of the points argued in its previous discussion.

A conspicuous feature of appellee's safety argument is its omission of all reference to the safety results of appellant's long-train operations in Arizona during March and April, 1940. At the risk of repetition, inasmuch as this experience was discussed in our opening brief (e.g., at pp. 205 and 240 of Vol. I; p. 189 of Vol. II) and was made the subject of a special finding by the trial court (Finding XII(t), R. 4018-4019), we point out again that appellee can apparently find no means of criticizing the

facts or challenging the conclusion. During this period 62 long passenger trains were operated, producing 15,587 train-miles and 243,749 car-miles. There were no accidents or casualties on any of these 62 trains. The only accidents or casualties in appellant's passenger train operations in Arizona during March and April, 1940, were on trains operated in full conformity with the law.

There were likewise operated 302 long freight trains, producing 37,257 train-miles and 3,180,278 car-miles; but during the period of their operation (April 3-30, 1940), while there were *six* accidents upon or in connection with the operation of short trains, there was only *one* upon a long train—and that accident took place when a brakeman fell, upon alighting from a caboose which at the time was detached from the standing train, and being handled alone by the engine.

Appellant has not claimed and does not claim that this experience conclusively shows that long-train operation in Arizona would or will be free of accidents or casualties; but clearly it does show that long-train operation is practicable, and certainly no more dangerous than the restricted operation, and thus confirms the conclusion stated by the Commission in its opinion relative to Service Order 85 (*Ex parte 156*, 256 I.C.C., at p. 536):

"The fact that freight trains in excess of 70 cars or passenger trains in excess of 14 cars are operated in other states is convincing evidence of its safety, except where unusual operating conditions exist."

A fair analysis of the testimony of record, as presented by the safety findings of the trial court (Findings

Nos. XI, XII, and XIII, R. 3969-4032) leads definitely to the conclusion that the law "bears no reasonable relation to safety, but to the contrary . . . impairs and lessens substantially the safety of appellant's train operations in Arizona and the adjacent affected territory" (Finding No. XII(v), R. 4022); and that the "legislative choice" here under review is entirely without any possible rational basis.

CONCLUSION

Appellee, in its brief, adopts the extreme position that a state statute regulating interstate commerce, if claimed to have been enacted under the police power for the purpose of safety, cannot be held invalid, no matter what its actual effect upon commerce, unless it is possible upon the whole record for the court to say that it has no rational basis as a police power ("safety") measure.

We submit that appellee's position is untenable. Under controlling decisions of this Court, a state statute defended as an exercise of the police power will be held invalid if it falls within any of the following classifications:

- (1) If it regulates a subject-matter plainly of national concern, where a uniform system of regulation is essential if any be required;
- (2) If, in the guise of promoting a claimed local interest or meeting a claimed local demand, it substantially and materially burdens, obstructs, and interferes with the free flow of interstate commerce;

- (3) If it directly infringes upon or conflicts with federal legislation having the same or similar purposes; or
- (4) If it bears no reasonable relation to a legitimate police power purpose.

The issue under any one of these tests is not dependent upon the determination under any other, as appellee appears to contend. Each in itself presents a separate and sufficient ground of invalidity.

The Arizona Train Limit Law, however, is invalid upon each and all of these grounds. It invades the *exclusive national field* by regulating a subject-matter (the lengths of interstate trains) of the highest national concern, where a uniform system is plainly essential. It imposes *material and substantial obstructions, burdens, and interferences* upon the free flow of commerce and thus impairs the national interest, and all without any plausible or reasonable excuse from the safety standpoint. It *infringes upon*, conflicts with, and unlawfully attempts to supplement the *federal safety statutes* which have the same purposes claimed for the state law and act upon the same ultimate subject-matter. *It bears no reasonable or any relation to safety* because it compels a method of operation under which the hazards, and the resulting accidents and casualties, are greatly increased rather than reduced.

All of the controlling facts of the case are before this Court in the trial court's findings; and the legal principles to be applied are clear. The judgment of the state supreme court should be reversed, with instructions to enter judg-

ment holding the law invalid under the Constitution of the United States.

Respectfully submitted,

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